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Team player styles, team design variables and team work effectiveness in Egypt

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By

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DEDICATION

To my parents,

my husband Alaa

and

my daughter Sarah

Ghada Awed Hassan El-Kot

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ABSTRACT

The literature has revealed few studies of management in Arab countries in general and particularly in Egypt. Many Egyptian organisations implemented the team concept a number of years ago, however, there do not appear to be any studies investigating team work effectiveness in Egypt. The literature review and the findings of a pilot study emphasised the need for empirical research in team work in Egypt. Team effectiveness models are examined in order to identify the factors that may enhance team effectiveness in Egypt. Team behavioural models are also examined to identify the importance of balanced team membership and its relationship with team effectiveness. These models are examined with the aim of developing a team work effectiveness model to be tested in a sample of Egyptian organisations, which hopefully will inform the development of effective teams in the Egyptian context.

The literature review revealed some significant predictors of team effectiveness such as team player styles, team design variables and team beliefs, which would enhance team effectiveness. The literature findings were used to develop a model for team effectiveness in Egypt. This model includes team player styles, team design variables (team autonomy, team size, team heterogeneity, team leader behaviour, team managerial support, team vision and team psychological safety), team beliefs (team potency and team efficacy) and team effectiveness (team performance outcomes).

The proposed model for team work effectiveness in Egypt is tested in two large successful Egyptian organisations that use teams working. Data were collected using a questionnaire in both organisations with interviews with managers carried out prior to the administration of the questionnaire in both companies. In addition translation procedures and pilot studies were carried out before running the main studies. Two levels of analysis, the individual and the group level, were used and a range of statistical procedures and techniques such as descriptive statistics, estimates of reliabilities, factor analysis, correlation, *t*-test and regression analysis were employed. The empirical findings from both companies suggested revisions to the proposed models for team effectiveness in Egypt.

Another supplementary study was carried out along with the main study in the large two companies with aim of investigating and examining one potential antecedent variable in the proposed model for team work effectiveness in Egypt. This study was concerned with testing the psychometric properties of the Parker Team Player Survey that was used in this thesis, and

also to investigate any relationships between team player styles and the individual difference variables in Egypt.

The findings from the main studies provided support for some variables in the proposed model for team work effectiveness in Egypt. The findings revealed the significant effects of some of the design variables on team effectiveness in Egypt. The findings do not provide sufficient evidence to confirm or refute the assumption that team player styles is necessary condition for team effectiveness, however, the findings revealed its role in its relationship with other variables in the model. An amended model for team work effectiveness is developed based on the literature and on the findings of the main studies to include team player styles, team design variables (team autonomy, team size, team structure and team reward), team beliefs and team effectiveness (subjective and objective measures). The amended model also includes some antecedents such as individual differences, organisational culture and the Egyptian culture. The amended model is suggested for further testing and considered as a basis for further research in team work in Egypt.

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Chapter One

Introduction

1.1 Increase in the use of teams

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1.5 Summary and contribution of the research

1.1 Increase in the use of teams

In recent years many authors have identified an increased interest in the development and use of a team approach to the solution of organisation and work-based problems. This is sometimes associated or has been associated with the perceived need to compete globally by reducing cost and improving quality (Niehaus and Swiercz, 1997; Parker, 1990). Russ-Eft, Preskill and Sleezer (1997) noted that there is an argument that the demands of current organisational tasks frequently require capabilities and resources that are beyond the means of any one individual. Moreover, Morgan, Salas and Glickman (1992) and Bacon and Blyton (2000) added that companies are increasingly looking for ways of organising work so that teams may accomplish their tasks more effectively.

Procter and Mueller (2000) stated that teamwork had emerged in different places at different times and that teamwork is one of many management techniques widely used in the late twentieth century. The origin of teams was identified in the 1920s by researchers working at the Industrial Fatigue Research Board (IFRB) in UK by Wyatt *et al.* (1929 in Procter and Mueller, 2000, p: 26). In Chicago in 1924 the Hawthorn studies investigated the effects of working in-groups on employees' morale and productivity (Whitehead, 1938; Roethlisberger and Dickson, 1939 in Procter and Mueller, 2000, p: 26). Procter and Mueller (2000) and Mueller, Procter and Buchanan (2000) stated that teamwork as a management technique in the 1950s was based on the work of the Tavistock Institute of Human Relations consultants in London. Tavistock consultants advanced the autonomous group work concept as a way of simultaneously satisfying employees' social and psychological needs and task needs. The use of autonomous work group (AWGs) have been found in Europe (e.g. Scandinavia, Netherlands and German) (Benders and Van Hootegem, 1999). In USA, teams were an important issue in debates about the quality of working life in the 1970s (Benders and Van Hootegem, 1999; Buchanan, 2000). Procter and Mueller (2000) stated that in Japan, the focus was on the use of quality circles in the

late 1970s and early 1980s as a source of competitive advantage in the Japanese industry, while in the 1980s the AWGs have been widely used in the UK.

Teamwork has been widely discussed in management literature from the 1980's through till now. Levi and Slem (1995, p: 30) stated that "most of the emphasis on teamwork in the 1980s was with production and service employees". Team work was seen by them as a new way to organise work in order to empower employees, shift decision making and make some control to the people actually performing the task, although many attempts at creating teams and empowering production employees achieved mixed success. They also added that "in the 1990s, the focus of teamwork activities is changing. On the factory floor, companies that have been successful in developing teams are continuing their organisational change efforts by trying to make teams more self-managing". Luthans (1995, p: 261) stated that "teams are becoming increasingly popular as a result of advanced information technology and the concern for total quality and organisational learning process". Hayes (1997) argued that teamwork became underline for emphasis as a managerial concept of the 1990s. Cohen and Bailey (1997) found that the management and academic writers have increasingly emphasised the importance of teams for organisational success in a modern economy. Hayes (1997, p: 1) also noticed "a growing number of organisations have found that changing to team-based work has had far more far-reaching effects than anyone could have predicted". Hayes (1997) found that in industry (and according to directors' reports) there was an increase in both profits and production levels after organisations went over to teamwork and there were other improvements in organisations' sales and marketing strategies. In the public sector, Hayes (1997) argued that tasks were performed more efficiently, jobs became enriched and team members offered support to their co-workers with difficult situations in their organisations.

Teams and teamwork appear to have emerged at different times at different places. Bergmann and De Meuse (1996) argued that the team concept has been considered as one of the leading strategies that is used by US organisations in the 1990s (such as American Express, Disney, Ford, General Mills and Hewlett-Packard) for achieving competitive advantage. They studied different perceptions of employees towards accepting the team concept, and the results revealed a favourable view of the team concept by employees. Gordon (1992, p: 59) noticed that a *Training Magazine* 1992 survey in US organisations showed that 82 percent of companies with 100 or more employees reported that they use teams. Gordon (1992) found that 90 percent of the largest organisations, with 1000 or more people, were using teams. Herriot and Pemberton (1995) studied many organisations and found that there is an increase in teamwork in UK organisations. Herriot and Pemberton (1995) also added teamwork increased by 79 percent in these organisations in response to the enquiry as to what they were doing to respond to new challenges and opportunities within their business environment. Alder (1997 in McHugh, 1997, p: 44) found further evidence of the increased use of teams and noted that in 1987, "only 28 percent of employees in the Fortune 1000 were employed at firms that used self-managed work teams, whereas by 1995 the number had grown to 68 percent". Ankarlo (1994 in Elmuti, 1997, p: 233) added that "more than 50 percent of all Fortune 500 companies utilise self-managed work teams, and it is estimated that by the year 2000, 90 percent of all North American organisations will have at least some type of self-managed work teams". Cully *et al.* (1998 in Procter and Muller, 2000, p: 7) referred to the results from the most recent survey in the Workplace Employee Relations Survey (WERS) in the UK which found that in 65 percent of workplaces team-based approaches were used for most of their employees.

Hayes (1997) concluded that teams have a great deal of potential value to contribute to organisations. Also, he added that teams could be a positive force for change in organisation, teams encourage flexibility, efficiency and employees involvement. Much of

the evidence supports the teamwork concept as a source of organisational benefits (Luthans, 1995; Bergmann and De Meuse, 1996; Alder, 1997; Cohen and Bailey. 1997 and Hayes, 1997). However, Furnham, Steele and Pendleton (1993) and Dulewicz (1995) argued for the need for empirical and organisationally based studies into teams. McIntyre and Salas (1995, p: 9) stated that "past and present research on teams is limited in its relevance to field settings".

While many researchers and authors have emphasised the benefits and value of teamwork, others have identified difficulties and drawbacks and criticisms. Procter and Mueller (2000) recognised that teamwork in practice had some difficulties especially with team members' training, reward systems and different levels of individual's motivations. On the same theme, Hardingham (1995) described some common team disadvantages, for example that teams need much time and energy to improve interactive communication skills among team members. Hardingham (1995) argued that some difficulties might be found in teams because some team members may find it difficult to work with others. In some other cases, teams can compete with one another and this can be detrimental to the whole organisation. Nahavandi and Aranda (1994) found a negative attitude towards the team concept amongst some team members who thought that team work is a waste of productive time because too much time is needed to build trust and agreement among team members. Geber (1994) and Greenberg and Baron (1996) found a degree of frustration among employees because of the lack of support which is needed from the managers if team work is to be effective. Tudor, Trumble and Diaz (1996) added that the frustration that might be found among team members could be because some team members feel that working in a team decreases their own chances for personal success. Greenberg and Baron (1996) suggested that the lack of co-operation between team members could be a reason for the ineffectiveness of teamwork. They added that the lack of co-operation among team members might be found among them because they do not share a common vision. Slobodnik and Slobodnik (1996) referred

to dysfunctional behaviour and attitudes among team members, such as false consensus when team members are silent because they fear showing different opinions from others. They also referred to the underground conflict that could lead to distrust among team members and also may be a problem for a team. Procter and Mueller (2000) noted that the different motivation levels among team members and different training levels could raise a problem among team members and could be a problem for teamwork as well. While Hayes (1997) raised the issue of social loafing as a team problem. Social loafing is described by Hayes (1997, p: 141) as: "some people, when they are working in a group, will actually put in less effort than they do when they are working alone".

Despite the sustained criticism, Procter and Mueller (2000, p: 33) stated that "the concept of teamwork appears to have survived as a management idea for almost half a century". Therefore, overall it appears to be a popular and useful way of organising work and teams are clearly important in many organisations.

1.2 Definitions

By reviewing the literature, it appears that, there is a relatively high level of agreement between different authors on the definition of a team as shown by the chronological presentation in Table 1.1.

Source	Team Definition
Francis &Young (1970, p: 8)	"An energetic group of people committed to achieving common objectives and producing high quality results".
Dyer (1984, p: 134 in Russ-Eft, Preskill, Hallie & Sleezer, 1997)	"Two or more people with a common goal, specific role assignment, and interdependence".
Adair (1986 in Sinclair, 1992, p: 612)	"A distinctive class of group, which is more task-oriented than other groups, and which has a set of obvious rules and rewards for its members".
Morgan, Glickman, Woodward, Blaiwes & Salas (1986, p: 24)	"A team is a distinguishable set of two or more individuals who interact interdependently adaptively to achieve specified, shared, valued objectives".
Sundstorm, De Meuse & Futrell (1990, p: 120)	"A small group of individuals who share responsibility for outcomes for the organisations".
Bartol & Hagman (1992, p: 24)	"A group of employees who are charged with working together to identify problems, form a consensus about what should be done, and implement necessary actions in relation to a particular task or organisational area".
Hogg & Abrams (1993, p: 184 in Lembke & Wilson, 1998)	"A social identity as a collection of individuals who classify, define and evaluate themselves in terms of common social category membership".
Greenberg & Baron (1996, p: 270)	"A group or a small number of people with complementary skills and are committed to a common purpose or set of performance goals for which they hold themselves mutually accountable".
Lussier (1996, p: 314)	"Two or more people interacting to achieve an objective".
Cohen & Bailey (1997, p: 241)	"A collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an entity embedded in one or more large social systems".

Table 1.1 Definitions of teams.

The findings from the above table can be summarised around six common features of a team as presented in Table 1.2.

Common features	Author (s)
1. Group of people	Francis & Young (1970), Dyer (1984), Adair (1986), Morgan, Glickman, Woodard, Blaiwes and Salas (1986), Sundstorm, De Meuse & Futrell (1990), Bartol & Hagman (1992), Hogg & Abrams (1993), Greenberg and Baron (1996), Lussier (1996), Cohen & Bailey (1997).
2. Achieve common goal	Francis &Young (1970), Dyer (1984), Morgan, Glickman, Woodard, Blaiwes & Salas (1986), Greenberg and Baron (1996), Lussier (1996).
3. Share responsibility of outcomes	Sundstorm, De Meuse & Futrell (1990) & Cohen &Bailey (1997).
4. Complementary skills	Greenberg & Baron (1996)
5. Social identity	Hogg & Abrams (1993), Cohen & Bailey (1997).
6. Interdependence	Dyer (1984), Morgan, Glickman, Woodard, Blaiwes & Salas (1986), Cohen & Bailey (1997).

Table 1.2 Common features of teams.

From the previous tables, it could be concluded that it is possible to use these findings to produce the following composite definition of a 'team'.

> A team is a set of two or more individuals working as a social identity, interacting, interdependent, sharing common goals and values with complementary skills, and sharing responsibility to achieve common objectives.

Cohen and Bailey (1997, p: 241) used the words 'team' and 'group' interchangeably in their research. They observed that "the popular management literature has tended to use the term 'team', while "the academic literature has tend to use the word 'group' ". In their research of reviewing the effectiveness of teams at work in organisations, Guzzo and Dickson (1996) used the labels 'team' and 'group' interchangeably, recognising that there may be some differences between them. Edmondson (1999) used the words 'team' and 'group' interchangeably in her research to investigate the organisational learning at the group level of analysis. Therefore, the word 'team' and 'group' are used interchangeably in this study when reviewing previous literature, however in the empirical and subsequent work the term 'team' will be used.

1.3 Types of teams

A review of the literature on studies of teamwork revealed that there are different types of teams that can be found in organisations and based on these differences types are vary according to their functions, the degree of autonomy, or their purposes. According to Greenberg and Baron (1996) teams could be categorised into several types that vary along four major dimensions. These types are: (1) work team and improvement teams based on the purpose of the team; (2) permanent teams and temporary teams based on the length of time that the team is operational of the work in each team; (3) work group and self-

managed work teams based on the degree of autonomy in each team and; (4) intact teams and cross-functional teams based on the authority structure in the organisation.

Hayes (1997) argued that there are different types of teams that serve many different functions. These types are labelled as: (1) production or service teams; which are involved in manufacturing, production or service with full time workers for a long period of time; (2) action or negotiation teams; which consist of highly skilled individuals engaged in special activity and they are entirely task-forced towards achieve the successful performance of their task; (3) project and development teams that operate across a long period of time to develop a certain project and; (4) advice and involvement teams that are concerned with giving advice and making decisions for the organisation. The advice and involvement teams' main role is to generate ideas and give advice to others. The members may perform other roles within their organisations while being a member of this team type. Keritner, Kinicki and Buelens (1999) identified four types of teams according to the various purposes of each team type, these are similar to Hayes (1997). These types are: (1) advice; (2) production; (3) project and; (4) action teams. They noted that advice teams make recommendations for managerial decisions while production and action teams carry out the management's decisions. While Cohen and Bailey (1997) also described four types of teams that are similar to those identified by Hayes such as: work teams, parallel teams, project teams, and management teams. A work team consists of full time workers with a stable relationship whom are responsible for producing goods or providing services. Parallel teams consist of people from different work units to perform certain functions and solve certain problems. Project teams tend to have a limited life and consist of different members from different functional units who are focused on new product project. Management team consists of the managers from each unit who are responsible for the all performance in the organisation.

Banker, Field, Schroeder and Sinha (1996) categorised team types according to the team autonomy ranging from low autonomy to high autonomy. These types are mentioned as traditional work groups, quality circles, semi-autonomous work groups, self-managing teams and self-designing teams. Traditional work groups perform the production activities without any management responsibility. In quality circles, memberships should be voluntary and the members are drawn from a particular department with a responsibility for making suggestions without authority to make decisions. Semi-autonomous work groups consist of members who manage major production activities, while others perform support activities like maintenance with a narrow scope of production tasks managed. Self-managing teams consist of a group of individuals with control over their tasks. Self-designing teams are similar to self-managing teams but with control over the design of the team.

By reviewing the different types of teams it can be concluded that there are some similarities among authors on the most common types of teams which could be found in organisations today. The work group was seen, by different authors, as the most common type of team used in the organisations for production and services (Greenberg and Baron, 1996; Hayes, 1997; Cohen and Bailey, 1997; Banker, Field, Schroeder and Sinha, 1996). Other team types with the same function may be found in different labels such as: action and negotiation teams (Hayes, 1997) and parallel teams (Cohen and Bailey, 1997). Also, advice teams (Hayes, 1997) and management teams (Cohen and Bailey, 1997). While Banker, Field, Schroeder and Sinha (1996) and Greenberg and Baron (1996) have similarly categorised teams based on the degree of autonomy in each team.

A self-managing team is a work team with a high level of autonomy among team members. Elmuti (1996, p: 9) defined self-managed teams as "a group of employees (five to 12) with all technical skills as well as the authority needed to direct and manage themselves". While

Garland and Elton (1995) and Garland, Ataman and Cook (1998) defined a self-managed work team as "a particular kind of team in that there is no hierarchical structure to the team and members are free to define their roles as they choose". Procter and Mueller (2000) stated that in the 1990s the use of self-managed work teams had taken place in half of the largest US organisations, while in the UK 40 percent of managers reported that they had used some self-managed teams. Flangan (1994) showed improvement in employees' productivity, quality and innovation as a result of team participation in self-managed teams. Moreover, Burrows (1993) and Elmuti (1996) indicated other improvement in self-managed team members' attitudes, behaviours and organisation's effectiveness in general. Sirkin (1993, in Elmuti, 1996, p: 234) argued that increased employee satisfaction, faster decisions and reduced costs are the results of using self-managed teams. Chaston (1998) referred to the research undertaken by the Tavistock Institute to identify the benefits of using self-managed teams in UK organisations, however, he claimed that introducing self-managed teams into small firms would make no positive impact on overall performance of the service firms.

1.4 Team work in Egyptian organisation : A pilot survey

Atiyyah (1992; 1993) noted that in Arab countries a growing interest in the application of management concepts and practices across national boundaries had been found as a result of many changes in the political, economic and social field in the last 30 years. In spite of that, Atiyyah (1992) completed an extensive survey of the relevant research and literature concerning the Arab countries' management features and applications and this revealed few empirical studies in the field of management in general. Atiyyah (1992) added that a few exploratory and descriptive management studies had been undertaken in Arab countries, however, the samples of these studies were small and drawn from one country at a time. However, not all results of these studies can be generalised on all Arab countries, putting on consideration the differences in beliefs, norms and values among people in Arab

countries. An extensive survey of the Arab countries (focusing on some nations such as Egypt, Kuwait, Saudi Arabia, Libya, Jordan, Lebanon and Iraq) investigated the main features of the management process, management style and employees' attitudes and behaviours (Atiyyah, 1992). This research (Atiyyah, 1992) may be summarised as follows:

Arab managers perform the four management functions; planning, organising, leading and controlling in their organisations and give less attention on planning and more on controlling as found by Al-Ameer *et al.* (1978), Atiah (1984), AbuZaid (1982) and Ammar (1988). Two different management styles were found among Arab managers based on culture differences. Some authors identified an authoritarian style while others identified a consultative style. The authoritarian style dominated in Arab countries such as Iraq (Al-Ameer *et al.*, 1978), Saudi Arabia (Abdul Wahab, 1982 and Ammar, 1982) and Jordan (Al-Khaddra, 1980). The consultative style dominated in Egypt, Jordan, Kuwait, Lebanon, Saudi Arabia, Qatar and Iraq (Muna, 1980; Al-Jafary and Hollingsworth, 1983; Ali and Al-Shakhis, 1985). Atiyyah (1992) argued that there was little interest in Arab countries to describe the Arab employees' attitudes and behaviour.

Atiyyah (1993, p: 7) noted that "it must be admitted that little is known about the mentality and practices of Arab managers from the few relevant field studies". He also argued that the qualification and experience levels of Arab managers had been improved in the last two decades as a result of many factors such as Western-educated managers, encouraging the managers to travel to different foreign countries to attend training programs or conferences which make them learn how to apply the Western management methods and techniques in their companies.

From the previous review of the few studies of management in Arab countries some general conclusions can be drawn: (1) there is low priority paid to planning among Arab managers; (2) there is more attention given to controlling among Arab managers; (3) which of the two different management styles (authoritarian and consultative) dominates in a country may depend on the cultural values and norms among people in each country; (4) there are some difficulties in studying Arab employees' attitudes and behaviours in organisations. Sometimes this may create access problems in Arab countries; (5) use of Western management techniques and methods in management practices had increased and (6) little is known about Arab managers' behaviour in practice.

Parnell and Hatem (1999) addressed the issue of the lack of critical management research in developing countries in general and Egypt specifically. They mentioned that Egypt's identity is distinct from other Middle Eastern countries as well as other African nations. Egypt has its uniqueness because of its strategic location bordering Africa, Europe and Asia, and these unique characteristics led Egypt to gain a leadership role among the Middle East nations. Also, Egypt has a strong societal emphasis on affecting and maintaining the harmony in the workplace in the Middle East nations. Butter (1999, p: 17) stated that "the Egyptian economy has been transformed during the 1990s". As Hatem (1994) noted the Egyptian economy had changed as a result of two main issues, both of them increased the investment in Egypt. The first was as a result of introducing the Open Door Policy in the mid-1970s in the Egyptian economy, thus encouraging private and foreign companies to invest in Egypt such as international joint venture companies and multinational companies in many different fields. The second was as a result of implementing an economic reform strategy that encouraged foreign investments.

Parnell and Hatem (1999) reviewed Egyptian approach to management compared with Western counterparts. One of their findings was that Egypt's business and management

practices lag behind the Western counterparts. They noted that relatively few studies of Egyptian management in practice had been undertaken in recent years as a result of the restrictions and the difficulties that face the researchers to collect data (primary or secondary). In Egypt collecting primary data for any research requires special permission from the government. Also, researchers may face the lack of availability, inaccurate or not up to date secondary data. Hatem (1994) referred to the limited access to data sets as another problem that faces Egyptian researchers, because there are some difficulties in publishing the findings of the research. Collecting data in Egypt is made even more difficult because of the lack of co-operation of the business companies and also from the managers themselves. Therefore, the telephone interviews and postal survey have in general not widely used as data collection methods in Egypt. Furthermore observation, as a data collection method, is not easily accepted in Egyptian companies because it needs permission from the company to observe people at work, which is usually rejected. While Hatem (1994, p: 126) added, "questionnaires are the most widely used method of data collection in Egypt". But the researcher should design the questionnaire with sensitivity to avoid any question that might not match with the Egyptian values and culture. Parnell and Hatem (1999) and Tessler (1987) pointed out the need to take account of local culture when designing research instruments. There is a clear need therefore to conduct more empirical investigations into management practices in the rapidly developing economy of Egypt.

Parnell and Hatem (1999) have noted that foreign investment and joint ventures in Egypt appear to have produced new values and norms in Egyptian companies' approach to management. Hatem (1994) noted that human resources and management, among other issues, had become critical issues for the Egyptian companies over the last few years as a result of the foreign investment and joint ventures. Improving and measuring the organisations' effectiveness had become a major concern for many Egyptian organisations.

New values and norms have been introduced to Egyptian organisations, such as the belief in the team work concept among other concepts, to achieve the organisations' goals, to increase productivity, to reduce costs and to compete globally.

Hofstede (1984, 1998) argued management practices were affected by cultures. Parnell and Hatem (1999) supported the view that there are relationships between management behaviour in Egypt and its culture. The Arab-speaking culture (including Egypt) scored high power distance according to Hofstede (1980), which means that employees often may tend to agree with their supervisors' opinion and listen to their orders and that they are often afraid to disagree with their managers. Also, managers always tell the employees what to do. Some of these observations may be explained by the fact that the Arab-speaking culture (including Egypt) scored high on uncertainty avoidance according to Hofstede (1980), which means that the people in that culture feel threatened by uncertain situations. That is perhaps one reason why there are many laws to control the rights and duties and to protect the employees in work in Egypt. The Arab-speaking culture (including Egypt) was classified as collectivist by Hofstede (1980), which means that employees are more involved in the work, and also the collectivist needs of the members of each group to work together for survival. Therefore, the loyalty to one's group (friendships and families) is very important to the Egyptian workers. The Arab-speaking culture (including Egypt) was also classified according to Hofstede (1980) as highly masculine that dependent on males in workplace more than females with a clear separation of male and female roles.

Team work in Egypt

Reviewing the most available recent documented records of Egyptian organisations does not provide any information concerning using teams in Egyptian organisations (Kompass Egypt Financial Year Book, 1998-1999). However, to investigate the team work in Egypt

the researcher reviewed the Egyptian library catalogue (this catalogue is located in Cairo University, which include all the information about all theses in all Egyptian Universities, 1998-1999). Reviewing this catalogue indicated that there does not appear to be any studies in Egypt that focus on evaluating teamwork in Egyptian companies.

Given the absence of information of the utilisation of team work in Egypt some preliminary investigation were undertaken to ascertain the frequency within which team working is used and the types of teams used. Therefore, a pilot survey of different manufacturing and services organisations that used teamwork was made by the researcher in some organisations in the Egyptian context to investigate the use of the teams, the team types used, the factors that facilitate the team work. Also the aim of the pilot study was to investigate the factors that seem to enhance team effectiveness from the managers' perspectives in these organisations and to investigate the factors that support the team concept in their organisations.

As mentioned previously, in Egypt research must comply with many steps laid down by the government regulation to collect any data or information related to any organisation, which in most cases creates barriers to any researcher (Parnell and Hatem, 1999). Therefore, the researcher used personal and professional contacts to gain access to enter a number of organisations located in Cairo and Alexandria in Egypt. Also, the researcher was involved in teaching undergraduate students in the Arab Academy for Science and Technology and Maritime Transport, Alexandria, Egypt (AAST-MT). These students had to run some analyses and evaluate some organisations in Egypt as a part of their projects for graduation, which facilitated contacting organisations. In order to assess the extent to which teamwork is undertaken the researcher carried out a pilot survey between September 1998 and January 1999. The organisations in this exploratory study were 20 manufacturing and services industries, all of them employing the team work concept in many of their

departments. Table 1.3 presents the organisations that were included and used in this survey.

Organisation Title	Organisation Type	Location
1. Coca-Cola	Manufacturing	Alex.
2. Nabil Ain Shams	Service	Alex.
3. Colorox	Manufacturing	Cairo
4. Fine Foods	Manufacturing	Alex.
5. Iron and Steel Co.	Manufacturing	Alex.
6. Mobinil	Service	Alex. & Cairo
7. Xerox	Manufacturing	Cairo
8. Zahran Co.	Manufacturing	Alex.
9. Heinz	Manufacturing	Cairo
10. Sumed	Service	Alex.
11. Niaza	Manufacturing	Alex.
12. General Motors Egypt	Manufacturing	Cairo
13. Amriya for Pharacutical industries	Manufacturing	Alex.
14. P-C link	Service	Alex. & Cairo
15. El-Shamadan Co.	Manufacturing	Alex.
16. Arab Contractors	Manufacturing	Cairo & Other branches
17. JIL	Manufacturing	Alex.
18. Alexandria Industrial Project Co.	Manufacturing	Alex.
19. Mantrac Co.	Manufacturing	Alex.
20. Aluminum El-Ahram Co.	Manufacturing	Alex.

Table 1.3 Egyptian organisations used in the pilot survey.

The researcher aimed to explore certain features related to teams and teamwork in the Egyptian context by conducting interviews with managers from different departments in the chosen organisations with a limited time-scale available. A structured interview was chosen as a method of data collection. As mentioned by Sarantakos (1993) interviews are often used as a method of data collection especially in the early stages in many social research designs. Easterby-Smith, Thorpe and Lowe (1991) claimed that the interview is often the best method of gathering preliminary information. However in Egypt it must be used with high level of sensitivity because many people are often afraid to give any information about their organisations or their salary or even the procedures of their work (Hatem, 1994). Easterby-Smith, Thorpe and Lowe (1991) suggested that face-to-face interviews provide the opportunity to acquire rich information, but these interviews should

be highly structured and based on carefully prepared questions. Sarantakos (1993) referred to structured interviews in which the questions are relatively firmly set but freedom is available to add supplementary questions during the course of the interview.

The managers' structured interviews were conducted with the aim of providing the researcher with the opportunity to explore certain features related to teams and teamwork in Egyptian organisations. Parnell and Hatem (1999) stated that researchers in Egypt must develop surveys or interviews with sensitivity to avoid questions that may offend the respondents. Therefore, it was planned to discuss the practical issues relevant to teams in the chosen organisations only. The allowed time was between 20 to 30 minutes with each manager. A small number of questions were used related to the team concept to guide the researcher during the interviews. These questions are: (1) when did your company start to implement teams? (2) in which department were teams used? (3) what team types are used? (4) what sizes are the teams? (5) what are the factors that facilitate the team work in their organisations? (6) do top management support the team concept? (7) and are there any characteristics that they could recommend for facilitating effective team work?.

These data were gathered opportunistically but give a useful overview of the situation in Egypt regarding team work. Data for this pilot reasearch was gathered by: (i) interviews concerned with the managers; (ii) data gathered by undergraduates in AAST-MT; (iii) and data gathered from the Annual Reports of each organisation. These findings are sumarised in Table 1.4 on page 22 below.

Findings of the survey with the chosen Egyptian organisations suggested that teams were implemented in some Egyptian organisations from the 1970's. Teams are used in many departments with the numbers in the team ranging from two to 20 depending on the organisation and the task. The most commonly used team type is work team, while there

are some other different teams types used such as quality circles, self-managed work teams, cross-functional teams and project teams. The Egyptian managers noted that top management usually supported the team concept in their organisation, because they believe in the benefits of teams on the organisational performance. The Egyptian managers argued that each task needs certain skills and team work needs harmony among all team members to reduce and to avoid any problems. They suggested that in some cases, team members prefer to work with their friends and relatives as much as possible. There are some factors recommended by the Egyptian managers in the chosen sample which seem to increase team effectiveness in their organisations. These factors are: (1) a suitable organisational culture that creates a suitable environment for encouraging work in teams; (2) team members' satisfaction is another important factor for team effectiveness and this is often related to rewards; (3) clear team goals and clear team vision that facilitate the work among team members towards specific targets and; (4) more team responsibility in making decisions is important but this also depends on the team members's skills and qualifications and their ability to make decisions.

From the above, it seems that according to Egyptian managers' point of view in the chosen organisations that there are some essential factors for teamwork effectiveness in Egypt which seem to correspond with the findings of previous studies. A review of the literature revealed some requirements for team effectiveness. For example, Cohen and Bailey (1997); Guzzo and Shea (1992); Hackman and Morris (1975); Sundstorm *et al.* (1990) and others stated that for teams to work effectively, a number of factors should be considered. These factors can be grouped together as team design factors (task design, context design and composition design); interpersonal factors (team members' participation and involvement level) and organisational factors (team values, beliefs, team spirit, team goals). Banker, Field, Schroeder and Sinha (1996) focused on the importance of team autonomy, team reward and team size as important factors that contribute to team

effectiveness. While Belbin (1981), Margerison and McCann (1985) and Parker (1990) argued for the importance of the team styles or roles that each team member plays in a team. They added that team members should have an ability to adopt different styles, as circumstances require. They also addressed the issue of having mixed team player roles or styles in each team to ensure team effectiveness. Edmondson (1999, p: 350) stated that "although much has been written about teams and about learning in organisations, our understanding of learning in teams remains limited".

Organisations Title	Org. Type	Nationality	Team types	Departments	Team Size	Team autonomy	Reward	Task interdependence
1.Coca- Cola	M	American-Egyptian	Work teams	Sales	8	Low	Money, recognition for all employees	High
2.Nabil Ain Shams	S	Egyptian	Work group Production team & project teams	Finance, technical & marketing	4-8	Moderate to high	Commision & fixed ratios	---
3.Colorox	M	American-Egyptian	Production teams	Product & supply	5-22	High	To a best team	Moderate to high
4.Fine Foods	M	Egyptian	Cross-functional teams,project teams& quality circles teams.	Marketing, finance, commercial, sales, manufacture, supply chain.	5-8	High except work schedule is low	Depends on each team objectives	High
5.Iron & Steel Co.	M	Egyptian -Japanese	Work teams, quality circles, cross-functional, self-managed teams.	All	2-30	Moderate to high	Based on each team work	High
6.Mobinil	S	Egyptian	Service teams	Marketing, research & development	4-6	High to moderate	Based on team efforts & outcomes	Moderate to high
7.Xerox	M	American in Egypt	Work teams	Service, sales & marketing	6-8	High	Money +self esteem rewards	---
8.Zahran	M	Egyptian	Production teams	Technical & packaging	4-7	High	On individual bias	--
9.Heinz	M	American in Egypt	Temporary teams, production teams& SMT	R&D, sales, marketing, finance, HR & export .	4-6	High	Bonus for best performing teams	---
10.Sumed	S	Egyptian & Arabs.	Work groups	All departments	5- 10	Moderate to high	Individual bias	High
11.Niaza	M	Egyptian	Work teams, quality circles, project teams.	All departments	4- 12	High	Team biased rewards	Moderate
12.General Motors	M	Egyptian branch	SMT	Supply & production	6- 10	High	Teams & individuals rewards	--
13.Ameria for pharmaceutical industries	M	Egyptian	Work group	Production, marketing, finance, HRM	5-7	Moderate to high	For excellent team	--
14.PC-link	S	Egyptian	Work groups	Sales, maintenance, finance. store	2- 10	High	Depends on the job	High
15.El-Shamadan	M	Egyptian	Work teams, SMT	Marketing, sales, export & inport	10- 30	High	Bonus	High
16.Arab Contractors	M	Egyptian	Work teams, SMT, project teams &quality circles.	All	10-20	High	Depends on the work	High
17.JIL	M	Egyptian- France	Work teams	Accounting, manufacturing, sales & development	4- 6	Moderate	Depends on performance	--
18.TEXALEX	M	Egyptian	Functional teams.	Sales, purchase and all departments	2-4	High except work criteria	Teams & individuals	High
19.Mantrac Co.	M	Egyptian	Work teams, Self-managed teams, Quality circles.	All Departments	4-7	Moderate -high	----	
20.Aluminuim Alahram Co.	M	Egyptian	Work groups & quality cirles	Sales, production & expert	3- 6	High	Depends on team performance	---

Table 1.4 The Egyptian pilot survey. Key M= manufacturing; S= service.

1.5 Summary and contribution of the research

This chapter has examined the growing trend in the implementation of teams in a variety of organisational and national contexts. A number of studies have indicated that team work appears to be one important factor in organisational success in Western organisations (Procter and Muller, 2000, Morgan, Salas and Glickman, 1992, Luthans, 1995, Cohen and Bailey, 1997). Team work is viewed by many academics and practitioners as a source of organisational benefits and as a way to improve organisations' productivity, sales and to ensure competitive advantage (Hayes, 1997, Levi and Slem, 1995, Bergmann and De Meuse, 1996 and Luthans, 1995).

In Arab countries a few exploratory and descriptive management studies have been found (Atiyyah, 1992) which suggested that the Egyptian management style tends to be consultative (Muna, 1980 in Atiyyah, 1992, p: 107), and which therefore might be seen as an appropriate context for team work in Egyptian organisations. There is a lack of management research in Egypt, one reason being the many restrictions on research (Parnell and Hatem, 1999). However, some Egyptian organisations adopt the Western approach in management and they are encouraged to use teams in their departments. This may be as a result of the changes in the Egyptian economy in last years, which may have been encouraged by the foreign investments in Egypt and by the adoption of Western approaches in the Egyptian context via the Western education and training.

Parnell and Hatem (1999) stated improving and measuring organisations' effectiveness have become one of the major concerns for many organisations in Egypt. This thesis may provide useful information for the Egyptian organisations (which implement the team concept and also for the other organisations that do not know about the team advantages) by providing a model or a framework to help them design and examine their teams and to evaluate their effectiveness. Therefore, this thesis seeks to achieve the following objective:

an examination of team working in a sample of organisations in Egypt and the development of a model encompassing team player styles and design factors that will inform the development of effective teams in the Egyptian context.

This thesis describes the previous research and literature on team effectiveness models, which yielded information on the most significant predictors of team effectiveness in Western organisations. These models are used to propose a framework for a team effectiveness model in Egypt (Chapter Two). Developing the team effectiveness model for the Egyptian organisations will be based on the literature and the findings from the Egyptian pilot study survey by the researcher.

Alongside team effectiveness models, there are a number of team behavioural models, which are discussed in this thesis (Chapter Three) to identify the team members' roles and the importance of the balanced mix of team members, which help to enhance team effectiveness. Links between team effectiveness models and team behavioural models are suggested. There are some other important variables for enhancing team effectiveness such as team vision, team leader behaviour, team managerial support, team heterogeneity, team psychological safety, team size, team rewards and team autonomy and these are examined in this thesis along with their important effects for enhancing team effectiveness. The importance of team beliefs found in the literature as a significant predictor of team effectiveness is examined (Chapter Two and Four). The proposed model for team effectiveness in Egypt is presented and the need for empirical research is addressed in this thesis (Chapter Five). The components of the proposed model are team player styles, team autonomy, team leader behaviour, team vision, team size, team heterogeneity, team managerial support, team psychological safety, team beliefs and team performance.

The empirical part of the thesis comprises two main studies conducted in two large manufacturing companies in Egypt, the first is in Iron and Steel company and the second is in Mantrac company, both are located in Alexandria, Egypt. These two large companies have an important role in the growth of the Egyptian economy (Butter, 1999, Iron and Steel Co. Annual Report, 1998 -1999 and Mantrac Co. Annual Report, 1999 - 2000). There are also some other pilot studies and a supplementary study alongside the main studies. The supplementary study was run in this thesis with the aim of investigating one of the potential antecedents in the proposed model for team work effectiveness in Egypt. The research was designed to examine the perceptions of team members and the perception of the team managers in both companies about the effectiveness of teams and the factors that contribute to that effectiveness. Data were collected from the two companies using quantitative methods (questionnaires) and qualitative methods (interviews with the managers).

In the first company (Iron and Steel Co.) a questionnaire was developed to examine the factors that seem to enhance team effectiveness in Egypt, which are the team player styles, team design variables, team beliefs and also to examine team performance in the company. Translation procedures and a pilot study in a department in Arab Academy for Science and Technology and Maritime Transport, Alexandria, Egypt was undertaken before carrying out the main questionnaire study and a number of modifications were subsequently made to the questionnaire. The development of the instrument is described in detail in this thesis (Chapter Six). Interviews with some managers in the first company were carried out prior to the administration of the questionnaire. Analysis of the data from the questionnaires was carried out using the Statistical Package for Social Sciences (SPSS, version 9.0). Some statistical techniques are used at two levels of analysis, at the individual level and the group level in the first company such as descriptive statistics, estimate of the reliabilities, factor analysis, correlation and *t*-test. A number of conclusions were drawn from the

analysis in this first study, which suggested a first revised team effectiveness model to be tested in the second company.

In the second company (Mantrac Co.) a modified questionnaire was developed to examine team effectiveness in this company (Chapter Seven). There is a new part to measure the Social Desirability, which had been suggested as a result from the findings from the first company. Translation procedures for the new part in the questionnaire and a pilot study in a department in Arab Academy for Science and Technology and Maritime Transport, Alexandria, Egypt was undertaken before carrying out the main questionnaire study and a number of modifications were subsequently made to the questionnaire. Interviews with some managers in the second company were carried out prior to the administration of the questionnaire. Data from the questionnaires were analysed using the SPSS as in the first company. Some statistical techniques are used at two levels of analysis, at the individual level and the group level in the second company such as descriptive statistics, estimate of the reliabilities, factor analysis, correlation and *t*-test and regression analysis. The findings and conclusions that were drawn from this study led to the development of a second revised team effectiveness model for Egyptian organisations. Comparisons of the results in the two companies were also discussed.

Further another supplementary study was carried out along with the main studies in the two companies to investigate one of the antecedents variables in the team effectiveness model in Egypt such as the individual differences. This supplementary study aimed to provide validation of the psychometric properties of the Parker Team Player Style PTPS (as originally designed, which is an ipsative form, and as a normative short form as modified by the researcher) with the aim of supporting the use of the modified scale made to the PTPS (Appendix A). Also, the aim of this supplementary study was to investigate the relationship between the cognitive style and team player styles as it was thought that it

might be one of the potential antecedents in the proposed model of team work effectiveness (Appendix A). Student samples drawn from Arab Academy for Science and Technology and Maritime Transport, Alexandria, Egypt were employed in this supplementary study.

An amended model for team work effectiveness is developed based on the findings from the main studies, the supplementary study and the research limitations to include team player styles, team design variables (team autonomy, team size, team structure and team reward), team beliefs and team performance (subjective and objective measures). The amended model for team work effectiveness in Egypt also includes some antecedents such as individual differences and the Egyptian culture (Chapter Eight).

From the theoretical point of view, this thesis aims to contribute to the previous work in team area. This thesis will seek to provide a link between team effectiveness models and team behavioural models to investigate the combined effects in enhancing team effectiveness. This thesis will seek to provide empirical support for some variables that are drawn from Cohen and Bailey' team effectiveness models (1997) regarding the significant predictors for the work team type in Egypt. This thesis will seek to provide some empirical support for the important role of team beliefs in team effectiveness models and will add some knowledge to the team behaviour models by testing the Parker's (1990) team player styles model, which is based on a personality theory and which is recommended for the use in team players studies by Kirnan and Woodruff (1994). This thesis will contribute to the Parker team player model by providing an examination of the psychometric properties and the factor structure of the Parker Team Player Survey, which Parker fails to provide. This thesis will address the impact of some antecedents of the team effectiveness model such as the individual differences, which might affect team effectiveness. This thesis aims to add knowledge to the Egyptian literature in the management field by investigating the use of

teams in Egypt, which does not appear to have been investigated before and therefore, this might be considered as one of the pioneer studies in that field. Finally, and most this thesis importantly provides a revised team effectiveness model for team work effectiveness based on the empirical findings from real teams in the Egyptian work setting. From the practical point of view, this thesis is valuable in providing a framework for the Egyptian organisations that are working with teams to help improve or evaluate the effectiveness of teams.

Chapter Two

Team Effectiveness Models

2.1 Introduction

In the previous chapter attention was drawn to teams in organisations as a way to increase productivity and competitiveness (Bettenhausen, 1991 and Sundstrom *et al.*, 1990). Different writers developed different models of team effectiveness to understand how groups or teams work, how individuals' characteristics affect on teams and how organisational context have an effect on both of them. Reviewing team effectiveness models would help identify the significant predictors of team effectiveness and the useful way to measure team effectiveness in their organisations. In this chapter different team effectiveness models will be reviewed to identify the determinants of team effectiveness, measures of team effectiveness and team effectiveness criterion from previous research as the basis to develop a model for team effectiveness in Egypt.

2.2 Team effectiveness models

Several models of team effectiveness had been developed in the literature through many years by different authors and have made contributions that have improved team effectiveness in organisations. A degree of commonality in identifying the determinants of team effectiveness would help in building a model of team effectiveness. The aim of reviewing some of team effectiveness models, which have been found in the literature, is to identify the underlying common determinants of team effectiveness. This would be used later to develop a preliminary model for team effectiveness in Egypt. Team effectiveness models are reviewed by chronologically.

2.2.1 Hackman and Morris (1975)

Hackman and Morris (1975) adopt an input-process-output team effectiveness model, which was proposed originally by McGrath (1964). McGrath (1964) developed an input-process-output framework for analysing group behaviour and performance. McGrath's main assumption was that the processes mediate input-output relations. Hackman and

Morris (1975) argued that the input factors affect performance output through the group interaction processes. This framework classified input variables into three sets and the output variables into two sets. The input variables sets are (i) variables that describe individual group members (e.g., pattern of member skills, attitudes and personality characteristics), (ii) variables that describe the group as a whole (e.g., group size, group structure and group cohesiveness), and (iii) variables that describe the environment within which the group works (e.g., group task characteristics, reward structure and the level of environment stress). In their model, the outputs are classified into performance outcomes (e.g., performance quality and number of errors) and other outcomes (e.g., member satisfaction, group cohesiveness and attitude change). They argued that all variables could be assessed at any two-time periods (t_1 and t_2) in order to investigate the changes over a specific time period. Their model was supported by some research findings based on laboratory experiments and field studies. The Hackman and Morris's (1975) input-out- put model for team effectiveness is presented in Figure (2.1) below.

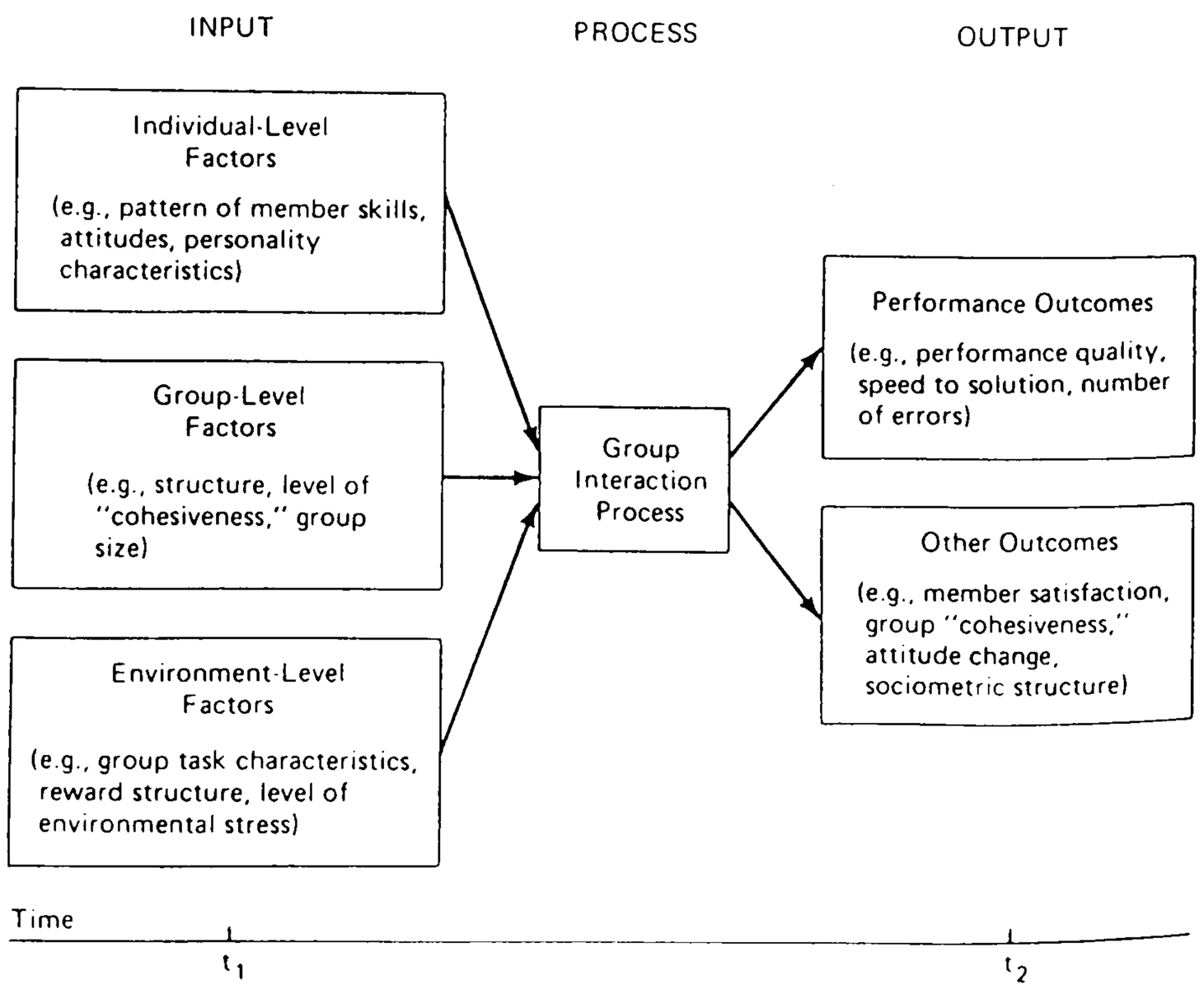

Figure 2.1: Hackman and Morris's team effectiveness model (1975). (Source: Hackman, 1987, p: 316)

2.2.2. Hackman and Oldham (1980)

Hackman and Oldham (1980) presented a model of work group effectiveness that focused on three key aspects of the design of the group, group task, composition of the group and group norms about performance processes, and argued that all would influence group effectiveness. They identified some intermediate criteria, which they argued would facilitate group effectiveness. These intermediate criteria of effectiveness are the level of group members' effort, the amount of knowledge and skills among the group members and appropriateness of the task performance strategies used by the group. They argued that their model did not present the traditional 'cause and effect' relations; instead, they focused on how they can create conditions that would help provide high team effectiveness. Hackman and Oldham (1980) argued that creating specific conditions (e.g. a motivating task for the group, a well-composed group and group norms) would help open discussion among group members of their performance strategies, which would satisfy them and hence the group process would be much more constructive. In Hackman and Oldham's model (1980) the final criteria of work group effectiveness is group performance. Hackman and Oldham's work group effectiveness model is presented in Figure (2.2) below.

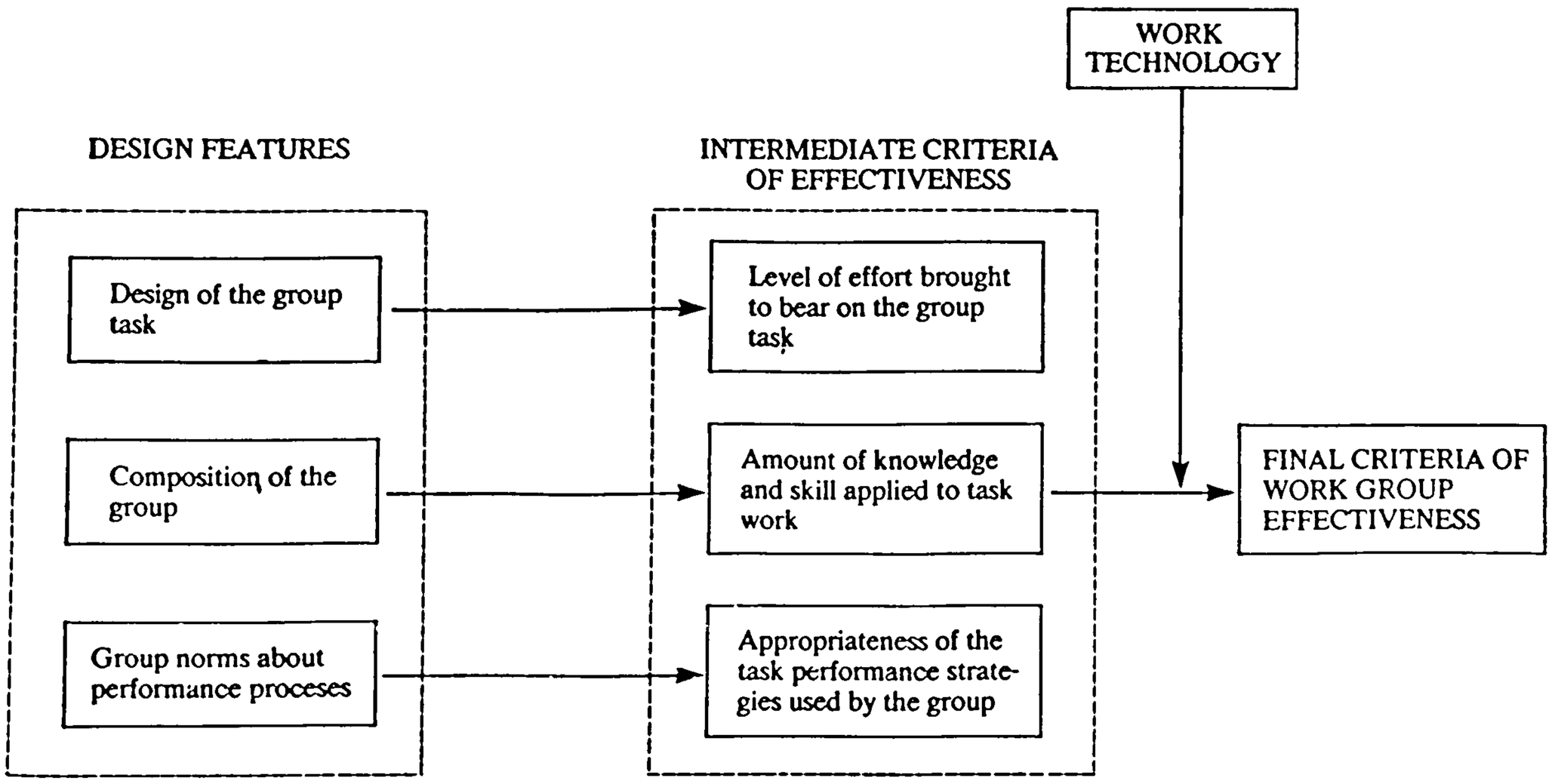

Figure 2.2: Hackman and Oldham's model of work group effectiveness (1980). (Source: Hackman and Oldham, 1980, p: 187).

2.2.3 Gladstein (1984)

Gladstein (1984) developed a comprehensive model of team effectiveness, which adopts the input-process-output approach. In his model the inputs includes group level variables and organisational level variables. The group level variables are group composition (e.g., adequate skills and heterogeneity) and group structure (e.g., role and goal clarity, formal leadership and size). The organisational level variables are availability of resources (e.g., technical consultation and training) and organisational structure (e.g., group reward and supervisory control). Gladstein (1984) measured the group process (e.g., open communication and supportiveness) as variables with moderate effects on group effectiveness. The group tasks (e.g., task complexity and interdependence) are proposed in his model as moderate variables on group effectiveness. Group effectiveness is measured by group performance and members satisfaction as suggested by Hackman and Morris (1975). Gladstein (1984) argued that group structures have direct and indirect effects on group effectiveness. The indirect effect is achieved when group structure variables influence group process, which have been influence on group performance. Gladstein's (1984) group effectiveness model is presented in Figure (2. 3) below.

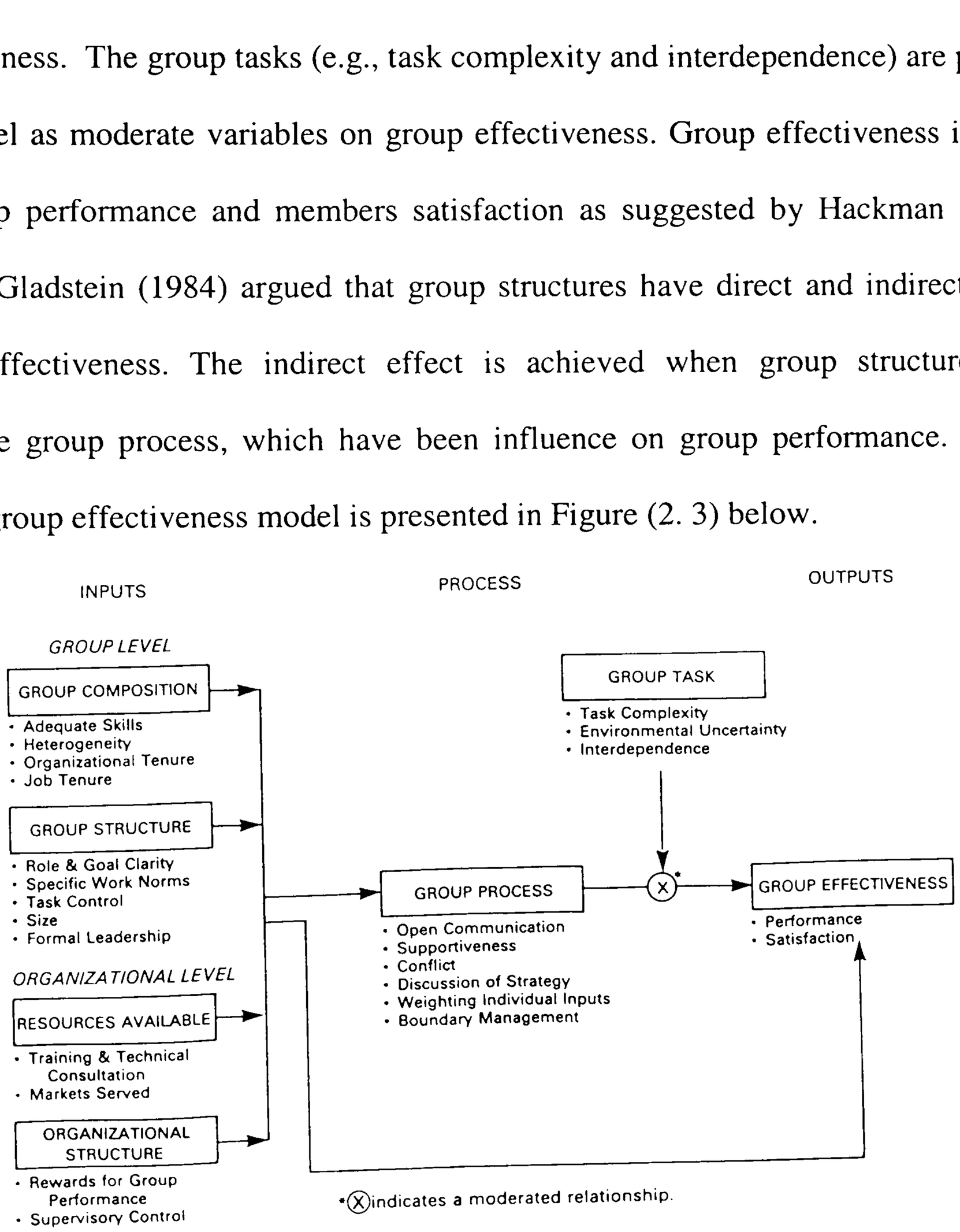

Figure 2.3: Gladstein's model of group effectiveness (1984). (Source: Gladstein, 1984, p: 502)

2.2.4 Hackman (1987)

Hackman (1987) presented a normative model of group effectiveness with three major points of leverage for enhancing group effectiveness. These points of leverage are: (i) group design, which facilitates the work (e.g., structure of the tasks, composition of the group and group norms about performance processes), (ii) organisational context, which supports competent task work (e.g., reward system, education system and information system), and (iii) group synergy, which provides assistance to the group to enable it to interact in an effective way. This model of group effectiveness added some criteria of effectiveness such as level of effort, amount of knowledge and skills and performance strategies used by the group. This model also focused on the material resources that are needed to facilitate the work to ensure effectiveness. Hackman (1987) measured effectiveness by (i) task output acceptable by others, (ii) capability of members to work together in future, and (iii) members' need satisfaction. Hackman (1987) argued that this model of group effectiveness would help to understand what should be presented for a group to perform effectively. Hackman's (1987) normative model of group effectiveness is presented in Figure (2.4) below.

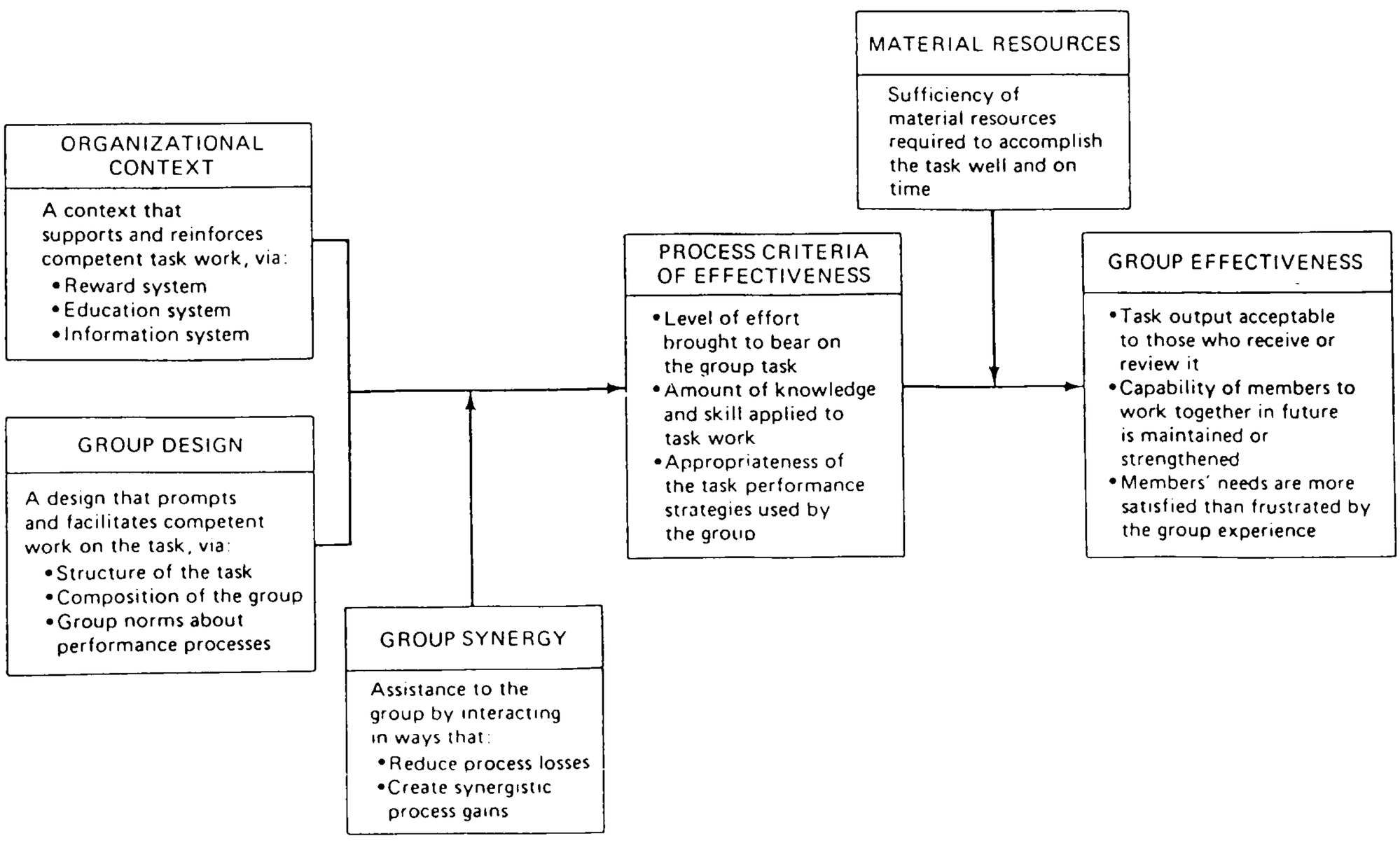

Figure 2.4: Hackman's model of group effectiveness (1987). (Source: Hackman, 1987, p: 331)

2.2.5 Shea and Guzzo (1987)

Shea and Guzzo (1987) proposed a model of the determinants of work group effectiveness. In their model, three factors played a major role in determining group effectiveness. These factors are: (i) task interdependence (the extent to which the group members should interact to accomplish the task), (ii) outcome interdependence (the extent to which the group members share common consequences), and (iii) potency (the collective belief of group members that their group can be effective). Shea and Guzzo (1987, p: 26) argued that "these variables influence group performance and can be influenced by members and supervisors of groups". Shea and Guzzo (1987) argued that their model helped diagnose how well existing groups are achieving determinants of work group effectiveness. Their model also raised two issues to enhance effectiveness. The first was concerned with the group management style, which should facilitate the work (for example: supervisors should guide, direct and monitor their groups) and the second issue was concerned the group's beliefs about their perception that their group can be effective. Shea and Guzzo's model (1987) adopted a task design approach and focused on the importance of potency as recommended by Bandura (1982), who argued for the importance of self-efficacy and collective efficacy for work effectiveness. In Shea and Guzzo's model (1987) group effectiveness was measured by group performance in accomplishing their tasks. Shea and Guzzo's (1987) model of the determinants of work group effectiveness is presented in Figure (2.5) below.

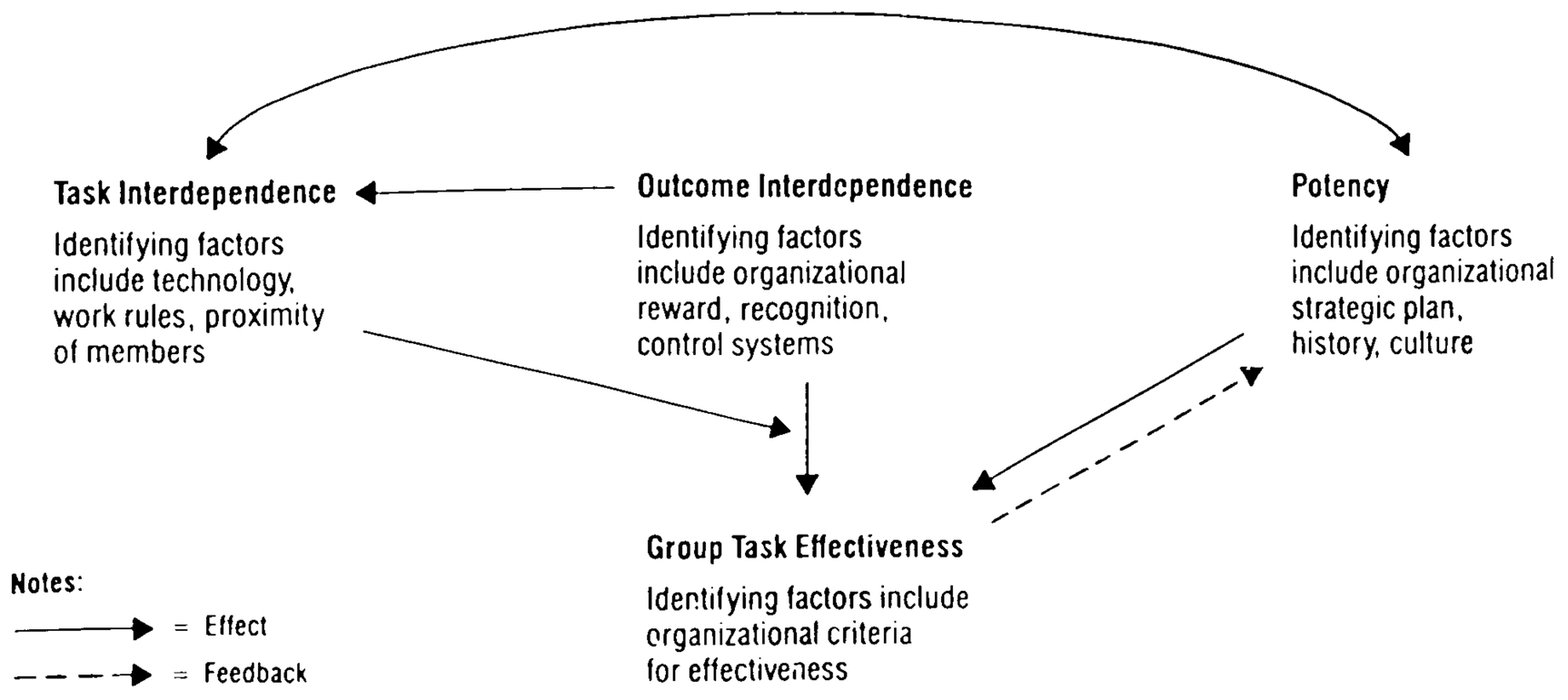

Figure 2.5: Shea and Guzzo's model of determinants of work group effectiveness (1987). (Source: Shea and Guzzo, 1987, p: 26)

2.2.6 Sundstrom *et al.* (1990)

Sundstrom, DeMeuse and Futrell (1990) proposed an analytic framework for team effectiveness. In their model team effectiveness is inter-correlated with organisational context, boundaries and team development. They focused on eight aspects of organisational context: (1) organisational culture (the culture in an organisation which focused on the collective values and norms among team members), (2) task design and technology (task design depend on technology and determined by it), (3) mission clarity (clear defined purpose within the organisation), (4) autonomy (semi-autonomous teams, self-managed teams and self-designing teams, which lies in central to work team design and management), (5) performance feedback (accurate, timely feedback on team performance), (6) rewards and recognition, (7) training and consultation (training and consultations on team tasks and interpersonal process), and (8) physical environment (the place in which teams operate). Sundstrom *et al.* (1990) argued that team effectiveness depends on organisational context factors and team boundaries as much as on the team's internal process. They also argued that team boundaries, which they presented in their model, might mediate the impact of organisational context on team development. Sundstrom *et al.* (1990, p: 122) argued that their model showed a reciprocal interdependence, which meant, "one indicates that boundaries influence effectiveness, which alters the boundaries, which further influence effectiveness". Team effectiveness was measured in their model by team performance and team viability, which means the team members are willing to work together in future tasks. Their model raised some important issues for enhancing teams' effectiveness such as the team membership (team composition, team size and team heterogeneity) and team development (interpersonal process, norms, cohesion and roles). They raised some unanswered questions on team effectiveness, which need further investigation: first, the demographics of the work group, which link teams to their organisational context; second, the application of work teams in depth through some longitudinal case studies; third, as assessment of the role of specific

contextual factors in work team effectiveness such as task design, mission clarity and autonomy; fourth "the challenge is to create an optimal mix of context features for each particular group". The Sundstrom *et al.'s* (1990) ecological framework for analysing work team effectiveness is presented in Figure (2.6) below.

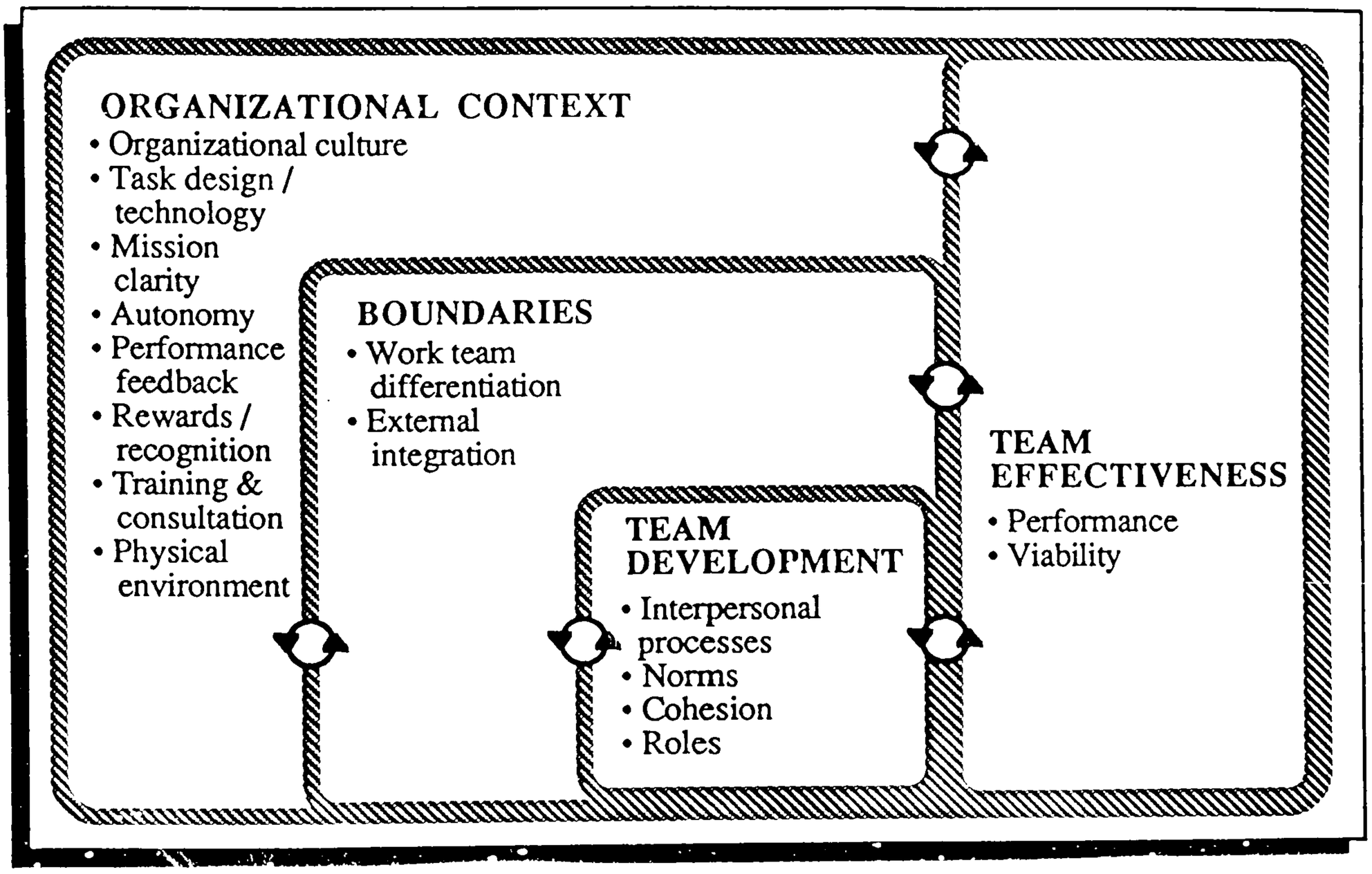

Figure 2.6: Sundstrom *et al.'s* ecological framework for analysing work team effectiveness (1990). (Source: Sundstrom *et al.*, 1990, p: 122)

2.2.7 West (1990)

West (1990) developed a four-factor model of group climate for predicting group work innovation effectiveness in organisations, which he argued often resulted from team activity. These four factors are (i) team vision and shared objectives (clear and realistic objectives in which the team members are committed), (ii) task orientation or climate for excellence (which refers to commitment to high standards of performance), (iii) participative safety (interaction between team members in a participative and interpersonally non-threatening climate), and (iv) norms for innovation (or support for

innovation, which provide support for innovation such as: co-operation to develop and apply new ideas). West (1990) measured the effectiveness by the quality and the quantity of innovation resulting from team members. According to his model, groups with clear defined, shared goals and vision are much more effective in developing new ideas. Participation and commitment were also suggested as important factors for group innovation effectiveness. West and Anderson (1992) found that team structure factors such as team size and team tenure and personality factors were another significant predictors for team innovation besides team climate factors (team vision, task orientation, team participative safety and support for innovation). Agrell and Gustafson (1994) proposed a tentative model (adopt from West, 1990). This model comprises three levels (organisational level, group level and individual level) that would facilitate innovation in work groups. The individual level factors according to them included the individual characteristics, self-efficacy and cognitive abilities that support creativity. The group level factors are group structure variables (size, diversity and tenure), group climate factors (vision and shared objectives, participative safety, task orientation and norms in support of innovation) and group beliefs (potency). The organisational level factors included leadership support, reward and appropriate work group boundaries. Agrell and Gustafson's model (1994) depicts three outcomes in terms of innovation as team effectiveness measure, which have an impact on the organisational context, the work groups and the individuals. The outcomes in their model could be positive outcomes, which are 'implement innovation' and 'abandon innovation' or negative outcome, which is 'neglect innovation'. They argued that when positive outcomes are achieved the individuals, groups and organisational context find support for innovation effectiveness outcomes. West's (1990) group climate innovation effectiveness model is presented in Figure (2.7) followed by Agrell and Gustafson's (1994) tentative model for work group innovation effectiveness in Figure (2.8) below.

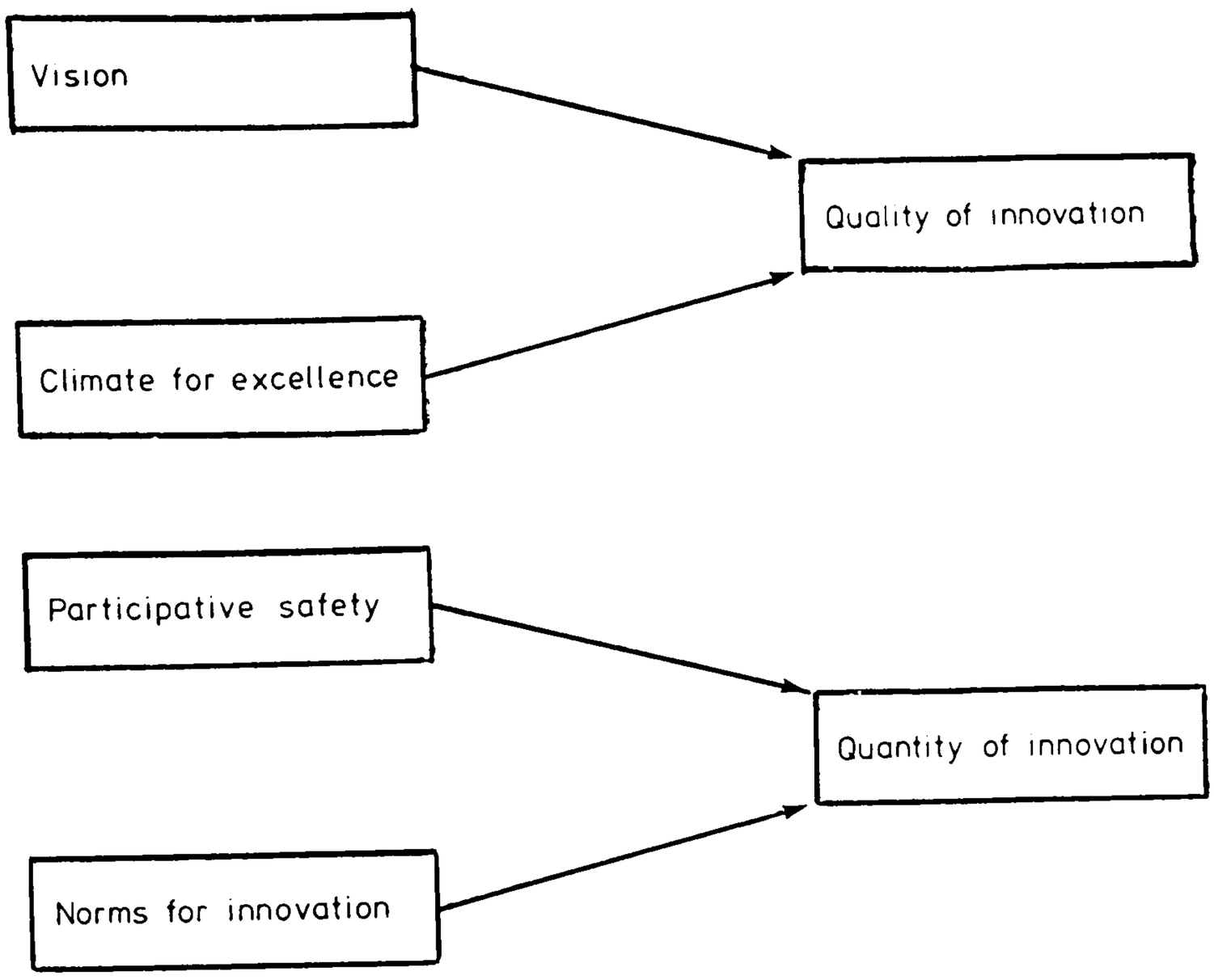

Figure 2.7: West's group climate innovation effectiveness model (1990). (Source: West, 1990 edited by: West and Farr, 1990, p: 317)

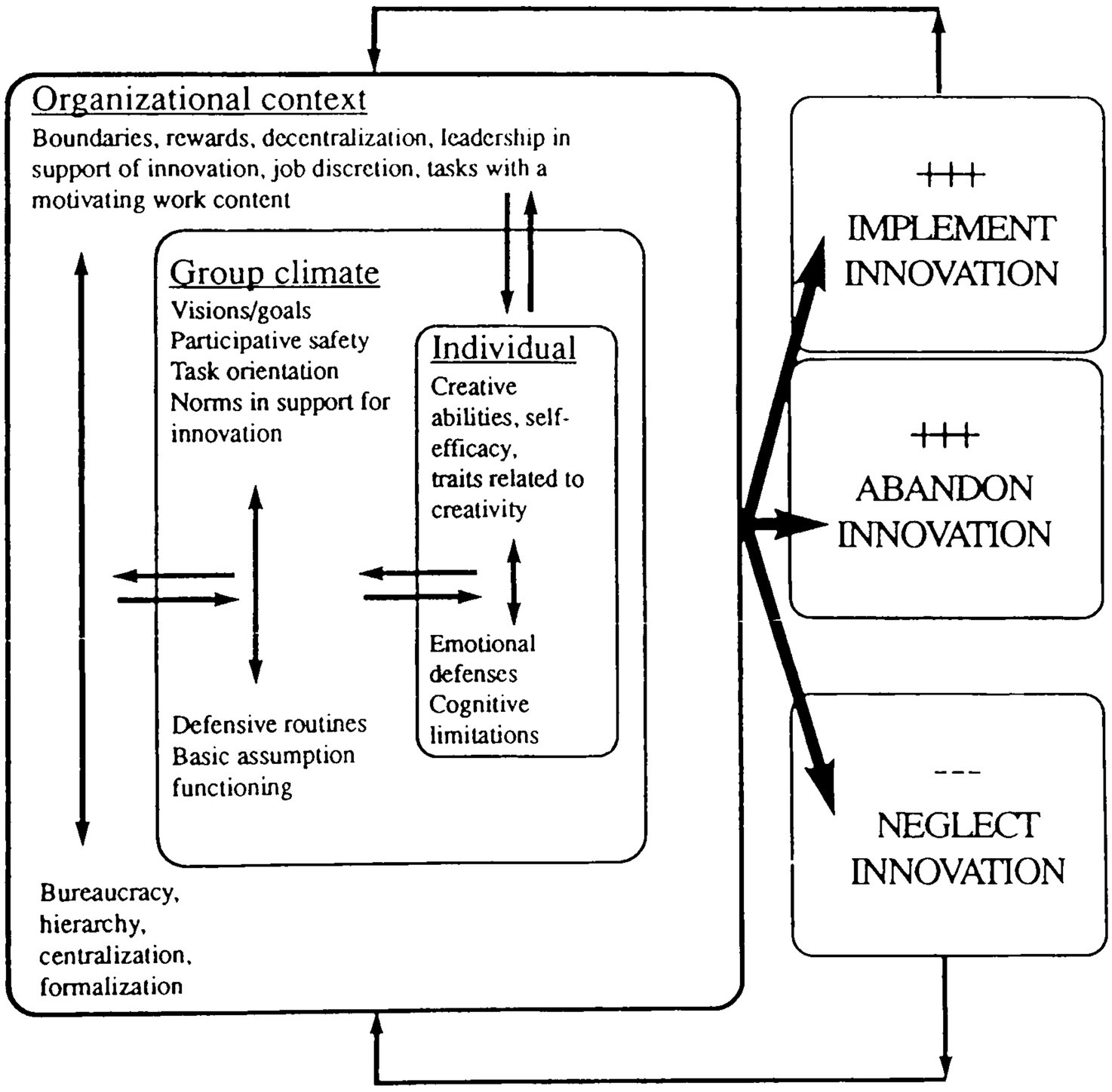

Figure 2.8: Agrell and Gustafson's tentative model for work group innovation effectiveness (1994). (Source: West, 1996, p: 336)

2.2.8 Tannenbaum *et al.* (1992)

Tannenbaum, Bread and Salas (1992) developed an input-throughput-output model for team effectiveness. The input variables are task characteristics, individual characteristics, work structure and team characteristics. The throughput variables are team process and team interventions and the output variables are team changes, team performance and individual changes. Their model also focused on the organisational and situational characteristics in which teams operate and which would affect teams' work. These variables are reward system, management control, organisational climate, inter-group relations, resource scarcity, level of stress, competition and environmental uncertainty. Team effectiveness as an output was measured by team changes (e.g., team norms and rules), team performance (e.g., quality, quantity, time, errors and cost) and individual changes (e.g., attitude, motivation and task). Tannenbaum, Bread and Salas's (1992) team effectiveness model is presented in Figure (2.9) below.

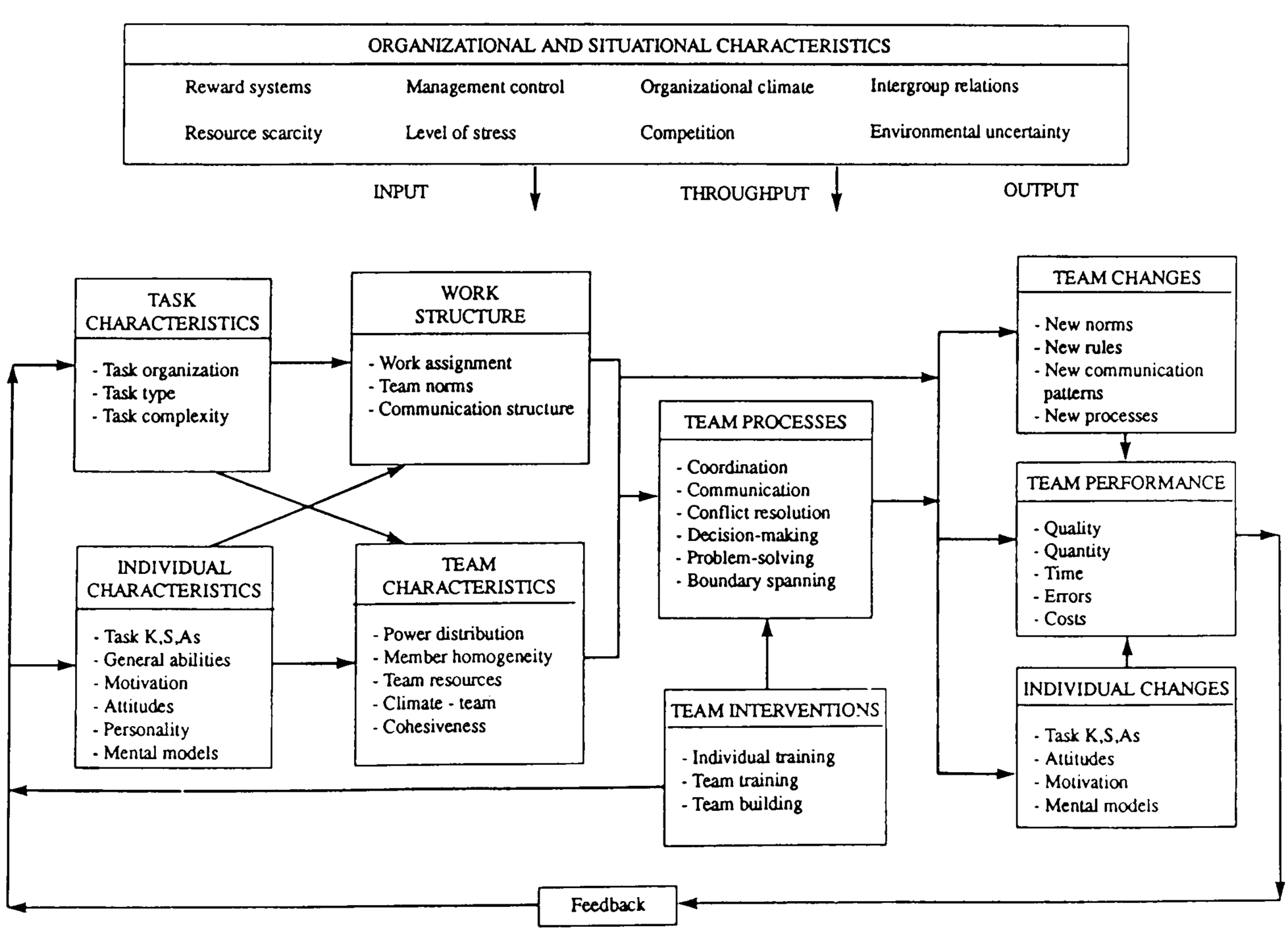

Figure 2.9: Tannenbaum, Bread and Salas's team effectiveness model (1992). (Source: West, 1996, p: 507)

2.2.9 Handy (1993)

Handy (1993) proposed a model for group effectiveness which encompasses three sets of variables. He labelled them as the givens (the group-related factors, the task-related factors and the environment-related factors), the intervening factors (leadership style, group functions and interaction patterns) and the outcomes (members satisfaction and group productivity). Handy (1993) classified the group-related factors into group size, member characteristics and presence of hidden agendas in the group. Task-related factors are the nature of the task and how group effectiveness is measured. The environmental factors are physical setting, cultural setting and leader and members' status. In Handy's model (1993) attention had been given to the relation between group size and effectiveness. In terms of member characteristics, attention had been given to the importance of different team roles for team effectiveness. Handy (1993) argued that Belbin's team roles (1981) and the idea that effective teams consist of a mix of individuals each performing different roles is important for group effectiveness. Handy (1993) measured group effectiveness by group productivity and members' satisfaction. Handy's (1993) model of determinants of group effectiveness is presented in Figure (2.10) below.

Givens:	**Group** ● size ● member characteristics ● hidden agendas	**Task** ● nature ● effectiveness criteria	**Environment** ● physical setting ● cultural setting ● leader/member status
Intervening Factors:	Leader style Group functions Interaction patterns		
Outcomes:	Member satisfaction Group productivity		

Figure 2.10: Handy's model of determinants of group effectiveness (1993). (Source: Gallagher, Rose, McCelland, Reynolds and Tombs, 1997, p: 502)

2.2.10 Cohen and Bailey (1997)

Cohen and Bailey (1997) proposed a heuristic framework for team effectiveness. In their model they argued that team effectiveness is a function of team design variables (task design, group composition and organisational context), environmental factors (industry characteristics and turbulence), internal process and external process (conflict and communication) and group psychosocial traits (norms and shared mental models). Team effectiveness in their model can be measured by performance outcomes (e.g., quality and quantity of productivity), attitudinal outcomes (e.g., job satisfaction and trust) and behavioural outcomes (e.g., turnover and absenteeism). Cohen and Bailey (1997, p: 245) argued that their framework "draws attention to the design factors which are the major points of leverage for influencing team effectiveness". They argued that their framework moved away from the input-process-output approach to focus on the design factors that have a direct impact on team outcomes and an indirect impact on outcomes through team internal process and group psychosocial traits. Cohen and Bailey (1997) argued that their framework illustrated that group internal process may be embedded in-group psychosocial traits, which are norms and shared mental models. Their framework also illustrated the direct influence of environmental factors on design factors. They added that team effectiveness outcomes might also influence group process, psychosocial traits and design factors, which they described as a reciprocal effect over time. Cohen and Bailey (1997) highlighted different factors that may be used as predictors for team effectiveness for different team types (work teams, parallel teams, management team and project teams). Cohen and Bailey (1997, p: 280) argued that "there is a need to select variables to be studied not because they have been traditionally studied, but because they help us to understand the effectiveness of different types of teams". Cohen and Bailey (1997) argued for the need to examine group behaviour and performance at multiple levels of analysis (individual, group and organisational level) to explain the individual effects, the group

effects on team effectiveness and on organisation's effectiveness. Cohen and Bailey's (1997) heuristic model of group effectiveness is presented in Figure (2.11) below.

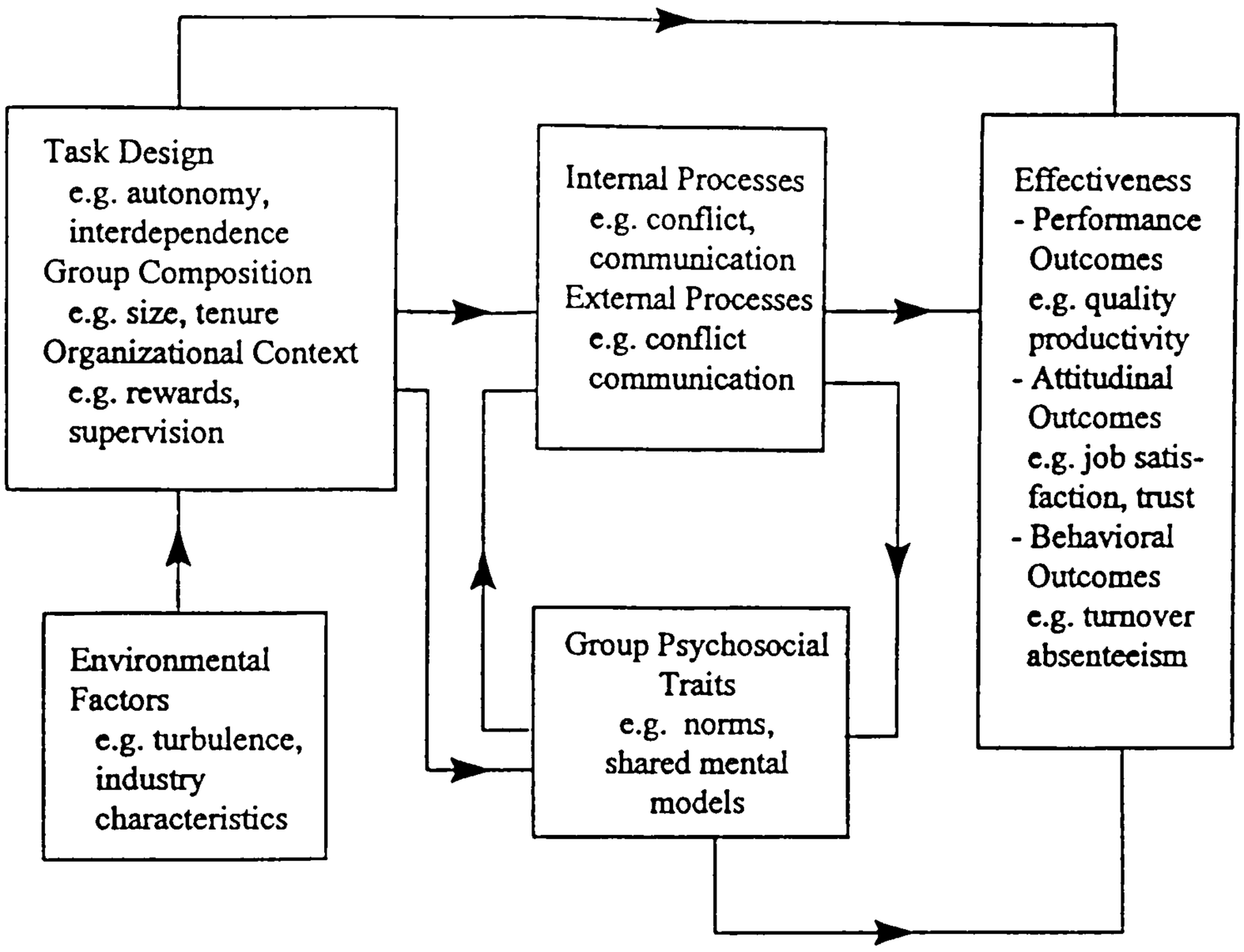

Figure 2.11: Cohen and Bailey's heuristic model of group effectiveness (1997). (Source: Cohen and Bailey, 1997, p: 244)

2.3 Determinants of team effectiveness

Examining team effectiveness models had revealed the important common determinants of team effectiveness, despite their different approaches. The mostly significant determinants of team effectiveness that appear in team effectiveness models are presented in the next section and summarised in Table 2.1 below. From this Table, it can be concluded the similarity among team effectiveness models in determining the most significant predictors for team effectiveness. These significant determinants are team design factors such as task design, group composition and contextual factors (Hackman and Oldham, 1980, Gladstein, 1984, Hackman, 1987, Shea and Guzzo, 1987, Sundstrom *et al.*, 1990, Handy, 1993 and Cohen and Bailey, 1997), team members' behaviour such as team characteristics and team roles (Hackman and Morris, 1975, Sundstrom *et al.*, 1990, Handy, 1993 and Cohen and

Bailey, 1997), and team beliefs (Hackman and Oldham, 1980, Hackman, 1987, Shea and Guzzo, 1987 and Cohen and Bailey, 1997). Team design factors are examined in different models (e.g., Hackman and Oldham, 1980, Gladstein, 1984 and Hackman, 1987) as an input factor affecting and influencing group effectiveness and they argued that task design might motivate team members. Sundstrom *et al.*'s model (1990) identified eight organisational factors, some of them are proposed for example by Hackman and Morris (1975), by Gladstein (1984), by Hackman (1987), by West (1990) and by Agrell and Gustafson (1994) as input factors (e.g., task design and rewards, norms and mission clarity and contextual variables). Shea and Guzzo (1987) also focused on organisational context as a task design factors in their model. Team beliefs are presented in team effectiveness models with different labels such as group norms about their performance in Hackman and Oldham (1980) and Hackman (1987) and as team potency in Shea and Guzzo (1987) and Agrell and Gustafson (1994). Team characteristics are examined in Handy's model (1993) along with the idea of the different mix of team members' roles as proposed by Belbin (1981).

Team effectiveness determinants	**Team effectiveness models**
1. Team members' behaviours (characteristics, roles and composition)	Hackman & Morris, 1975, Gladstein, 1984, Sundstrom *et al.*, 1990, Tannenbaum *et al.*, 1992, Handy, 1993, Agrell & Gustafson, 1994 and Cohen & Bailey, 1997.
2. Team design factors	
2.1 Task design (autonomy, work technology)	Gladstein, 1984, Shea & Guzzo, 1987, Hackman & Oldham, 1980, Hackman, 1987, Sundstrom *et al.*, 1990, Tannenbaum *et al.*, 1992, Handy, 1993 and Cohen & Bailey, 1997.
2.2 Group composition (size and heterogeneity)	Hackman & Oldham, 1980, Gladstein, 1984, Hackman, 1987, Handy, 1993, Agrell & Gustafson, 1994 and Cohen & Bailey, 1997.
2.3 Contextual factors (team rewards, mission clarity, team vision, leader behaviour, management support, team safety and team culture)	Hackman & Morris, 1975, Gladstein, 1984, Hackman, 1987, Shea & Guzzo, 1987, Sundstrom *et al.*, 1990, West, 1990, Handy, 1993, Agrell & Gustafson, 1994 and Cohen & Bailey, 1997.
3. Team beliefs	Hackman & Oldham, 1980, Hackman, 1987, Shea & Guzzo, 1987, Agrell & Gustafson, 1994 and Cohen & Bailey, 1997.

Table 2.1: Summary Table of determinants of team effectiveness as suggested by team effectiveness models.

Some of team effectiveness determinants (mentioned above) were tested in empirical studies which provide evidence to support the assumptions of some determinants as suggested in the various team effectiveness models. Some of these studies' findings are presented in the following part. These determinants are team design variables, team members' behaviour and team beliefs as indicators of team effectiveness.

2.3.1 Team design variables, which are team autonomy, team interdependence, team heterogeneity, team size, team reward, team vision, team organisational support, team safety, team leader behaviour and team culture are presented in the following part as follows. (Some of these variables will be revisited in Chapter Four).

Team autonomy: Breaugh (1998) stated the importance of work autonomy in performing the tasks. Hackman and Oldham (1975, p: 162 in Breaugh, 1985, p: 553) defined autonomy as "the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out". Cohen and Bailey (1997) noted that autonomy was found to be positively related to many other variables affecting team effectiveness such as satisfaction, organisation climate, trust in management and low turnover. Sprigg and Parker (1998) argued that establishing autonomous work teams could lead to more active involvement of employees in making the decisions, and this might lead to high job satisfaction and high performance.

Team interdependence: Sprigg, Jackson and Parker (1997) argued for the importance of work interdependence for team work effectiveness. Shea and Guzzo (1992, p: 296) defined it as "the extent to which group members must interact and depend on each other in order for the group to accomplish its work". Liden *et al.* (1997 in Sprigg *et al.*, 1997) argued that task interdependence might be considered as a necessary condition for semi-autonomous

work groups, which might lead to high performance. Liden *et al.* (1997) supported the positive relationship between task interdependence and the level of group control and group performance. Sprigg *et al.* (1997) found work interdependence to moderate the relationship between team control and team effectiveness.

Team heterogeneity: Jackson, May and Whitney (1995 in Guzzo and Dickson, 1996, p: 311) found a link between team heterogeneity and team effectiveness. Guzzo and Dickson (1996, p: 311) defined it as "the mix of personalities, gender, attitudes, and background on experience factors". Bantel and Jackson (1989) found a positive relationship between heterogeneity in top management teams in the banking industry and organisational innovation. Magjuka and Baldwin (1991) measured team heterogeneity within the computer manufacturing industry and found that teams with more heterogeneity evaluated their effectiveness more positively. Campion *et al.* (1993) found no relationship between team heterogeneity and productivity, employees' satisfaction and managers' rating of performance in a service industry.

Team size: Bettenhausen (1991) found that group size had been shown in the literature as a context variable that affects group process and outcomes. Attention was paid to team size to indicate the sufficient team size to encompass the appropriate mix of team roles (Belbin, 1981, 1993 and Margerison and McCann, 1985). Hambrick and Mason (1984) referred to the size of team as an effective factor for the significant relationships that were found between team size and team tenure and team effectiveness. Hackman (1987) mentioned that a smaller number of team members to do the task could be better. Nieva, Fleishman and Rieck (1978 in Sundstrom *et al.*, 1990, p: 126) found that when evaluating group performance in the laboratory, performance was found to decrease when the number in the group exceeded the required minimum. In the same direction, Steiner (1972) referred to the difficulty of co-ordinating people in large size teams, which can lead to a 'social loafing'

as mentioned by Latane, Williams and Harkins (1979 in Sundstrom *et al.*, 1990, p: 126). In a meta-analysis study by Mullen, Symon, Hu and Salas (1989) it was revealed that a large work group size lead to dissatisfied employees. Mullen, Johnson and Drake (1987) supported the idea that organisational productivity may be increased with a narrow supervisory span of control.

Team reward: Procter and Mueller (2000) referred to the importance of reward but noted that there were many team studies but with little to say on the subject of reward. There are different forms of payment systems based on team performance or individual performance. Harvey and Von Behr (1994 in Procter and Mueller, 2000, p: 15) found that an individual pay system in USA and in Germany in non-automotive industry had the effect of encouraging workers to work and stay on one machine to get more money. Kessler (1994 in Procter and Mueller, 2000, p: 15) suggested that performance-related pay could be based on individual appraisal. Lloyd and Newell (2000) argued that pay systems that are based on individual performance would effect team effectiveness negatively, which can lead to the development of competition rather than co-operation among team members. They argued that team-based pay would encourage team members to co-operate and to disciplined. Procter and Mueller (2000) suggested that there are two types of payment that should encourage team work. These types are skill-based pay and team-based pay though they mentioned that both of these types had some practical problems. However, when Mueller and Purcell (1992) studied a skill-based system in the European automotive engine industry it was found that they corresponded with the lowest level of performance among team members. In another study, team-based reward systems were mentioned by Ezzamel and Willmott (1998) as a source of conflict among team members in a clothing manufacturing industry as a result of the way the bonus were distributed to team members based on team performance. They noted that the bonus could be earned by individuals depends on the team performance as a whole; therefore, the team members should put their

effort to work very hard to get the bonus. This might encourage the social loafing among some team members, which might raise conflict among them.

Team vision: Dunning, Pirola-Merlo, Hirst, Mann and Atkins (1998), Kivimaki, Kuk, Elovainio, Thomoson, Kalliomaki-Levanto and Heikkila (1997) based on the work of West (1990) argued that team climate has four factors: (a) team vision; (b) participative safety; (c) task orientation and; (d) support for innovation. Team climate vision was chosen as a variable that may influence team effectiveness. Kivamaki and Elovainio (1999) noted that if there is a focus on clear and realistic objectives to which team members are committed; which is a team vision, this would lead to better team performance. The Team Climate Inventory (TCI) is an instrument that has been used in different research projects and has demonstrated adequate psychometric properties (e.g. reliability, validity and factor structure). William, Patterson and West (1998) referred to the Team Climate Inventory as a method used to evaluate the degree to which the team has an appropriate climate that may lead to team effectiveness. West and Wallace (1991) referred to team climate, team commitment and team collaborations for determining team effectiveness.

Organisational support and safety: Hackman (1990) identified six different types of organisational support that could increase team effectiveness. These types are clear team targets for all team members, adequate resources for their work, reliable and accurate information to make good decisions, training and education that add required skills and knowledge, regular feedback to carry out the tasks and technical and process assistance to carry out the task. Edmondson (1999, p: 354) argued that team psychological safety would facilitate the learning behaviour in work teams, which is defined as "a shared belief that the team is safe for interpersonal risk taking". She argued that team psychological safety had reduced the interpersonal barriers to learning behaviour when team members hold similar perceptions.

Team leader behaviour: Procter and Mueller (2000) stated that numerous studies showed the importance of the team leader role for organisations that work with teams. Manz and Sims (1987) suggested that leader behaviours help teams to manage themselves, but they did not provide any evidence of a link between leader behaviour and team performance. In the same direction, Cohen *et al.* (1996) were unable to provide any evidence of leader role effectiveness. Procter and Mueller (2000) argued for the difficulty of developing a leader from team members. They argued also that bringing in a team leader from outside could cause resentment among them.

Culture: Teams are embedded within organisations and these organisations are embedded in a society. Gibson (1999) noted that the values, beliefs that exist in society (the larger culture) would affect the values and beliefs of the individuals and teams in the organisations. Gibson (1999, p: 140) stated that "theorists developing cultural frameworks have indicated that 'field independence' and 'collectivism' are two of the most influential aspects of a cultural context", which impact upon team interactions. Witkin, Goodenough and Oltman, 1997 in Gibson, 1999, p: 140-141) referred to field independence as "how people perceive their context and environment". In a related study of team effectiveness, O'Brien and Buono (1996) suggested that organisational culture among other variables such as task design, level of technology and reward systems in which teams work had effects on team effectiveness. Kermally (1997) supported the factors that were suggested by O'Brien and Buono. Rahmati (2000) studied the differences on the impact of group technologies between students works group from two different national cultures; Australia and Malaysia. The results showed some differences between groups in the values they used in the decision making process. Malaysian participants were likely to agree with their seniors in the group because the Malaysian group showed significantly higher uncertainty avoidance, religious commitment and collectivism, which affect their way of making the decisions.

2.3.2 Team members' behaviours, which are team characteristics, team members' roles and styles and gender compositions are presented in the following part as follows. (This will be revisited in Chapter Three).

Team characteristics: Nurick (1993) argued that selecting team members, team members' interpersonal skills and resolving conflicts among team members were significant factors influencing team effectiveness. Arnold (1996) added that team members should welcome the concept of a 'team' and get a feeling of working together to contribute to themselves and to their organisation. Blanchard, Carew and Parisi-Carew (1996) found that a clear purpose, shared values, more empowerment, good relationships, open communications, more recognition and appreciation and high morale among team members played important roles in creating a positive teamwork environment that contributes to team effectiveness. In a related study, Campion, Medsker and Higgs (1993) studied the relationships between work group characteristics and effectiveness. They referred to job design characteristics, interdependence characteristics, composition characteristics, context characteristics and process characteristics for group effectiveness. In another study, Campion, Papper and Medsker (1996) replicated the previous research of Campion, Medsker and Higgs (1993) with professional knowledge worker jobs and different measures of effectiveness. Their findings supported the previous results and added more significance to process characteristics, followed by job design.

Team players / members' roles and styles: Parker (1990) and Margerison and McCann (1985) stated that the characteristics of teams and their members are essential issues for team effectiveness. Margerison and McCann (1985) argued that high performing teams need various skills coupled with flexibility to deal with different situations. Campion, Medsker and Higgs (1993) found a relationship between team composition and team effectiveness. Magjuka and Baldwin (1991) found that team effectiveness was positively

associated with large team size with heterogeneity and with a balanced mix of team members' skills. Parker (1990) emphasised the importance of mixed styles that each team member has to play to contribute to team effectiveness. Margerison and McCann (1985) referred to the importance of the balance of team preferences for team effectiveness. Senior (1997) also referred to the importance of having balanced team roles for team effectiveness.

Team gender composition: William, Patterson and West (1998) studied the effect of gender diversity on perceptions of the process and outcomes of organisational teams. The results showed that gender diversity was related to some aspects of team functioning in team participative safety, team support and team performance. However, Goktepe and Schneier (1989) found no significant gender differences in performing a leader role in a group.

2.3.3 Team beliefs, which are team potency or team collective efficacy that would affect team values are presented in the following part as follows.

Gibson (1999) stated that team belief is an important determinant variable of team effectiveness. Gibson (1999) noted that even if the groups appear to have equal or similar abilities, skills and resources they can form different beliefs about their ability in doing the work. Different authors examined the relationship between team beliefs and team effectiveness (Campion, Medsker and Higgs, 1993; Edmondson, 1999; Gibson, 1999 and Guzzo and Shea, 1992). Different labels found among different authors indicated the same meaning for team beliefs' with terms such as team efficacy or collective efficacy (Bandura, 1982; Gibson, 1999 and Edmondson, 1999); potency (Bar-Tal, 1990; Shea and Guzzo, 1987; Guzzo and Shea, 1992; Guzzo *et al.*, 1993 and Campion *et al.*, 1993); and team spirit (Campion *et al.*, 1993). The labels team potency, team beliefs, team efficacy, team spirit

are sometimes used interchangeably in the literature as noted by Campion *et al.* (1993). Campion *et al.* (1993) argued that team potency is similar to team spirit and self-efficacy. Lindsley, Brass and Thomas (1995, p: 672) argued for the "cyclic nature of the efficacy-performance relationship" and its impact on the performance of individuals, groups and organisation. Campion *et al.* (1993) referred to the importance of team potency for team effectiveness. Edmondson (1999) referred to the role of self-efficacy in enhancing the individual performance.

Eby, Adams, Russell and Gaby (2000) referred to self-efficacy as an attitudinal variable based on team members' experiences within the organisation. Bandura (1982, p: 122-123) defined self-efficacy as: "a person's belief that he or she can successfully perform a behaviour required to obtain a desired reward". Bandura (1982) argued for the relationship between self-precepts of efficacy and behaviour. He noted that high self-precepts of efficacy usually produce high performance among people. Bandura (1982, p: 125) stated that "self-precepts of efficacy often surpass final performance as predictors of future performance" as a result of their strong beliefs of efficacy. Bandura (1982) noted that the findings from previous studies in social learning showed that the higher level of perceived self-efficacy, the higher performance produced. The findings from the literature supported a direct relationship between self-precept of efficacy and individual performance. Bandura (1982, p: 128) noted "performance includes among its determinants self-precepts of efficacy". Edmondson (1999) added that team-efficacy is a collective sense of confidence in the team's ability to meet its objectives and overcome hurdles. There is a similarity between team spirit and team efficacy in their effect on building confidence among team members.

According to Bar-Tal (1990) and Guzzo *et al.* (1993) the group beliefs received little attention in previous research despite its importance. Bandura (1982, p: 143) noted that

"collective efficacy is rooted in self-efficacy". Bar-Tal (1990 p: 36) defined potency or group beliefs as "convictions that group members (a) are aware that they share and (b) consider as defining their groupness". Guzzo *et al.* (1993, p: 90) referred to collective efficacy as "an individual's belief that a group can perform successfully". Team potency defined by Guzzo and Shea (1992) as the belief by a group that it can be effective. Lindsley *et al.* (1995) defined group efficacy in the same manner, in which a group efficacy is a group belief in its ability to perform effectively.

Bandura (1982, p: 143) noted that people's sense of collective efficacy means "they can solve their problems and improve their lives through concerted effort". Guzzo *et al.* (1993) argued that the collective efficacy had been found as a predictor of group performance. Sayles (1958 in Guzzo *et al.*, 1993, p: 88) reported that teams with a strong sense of their beliefs tended to be effective as a result of high levels of motivation among team members. He also pointed out that team efficacy is a function of several factors such as the organisational context and the group goal clarity. On the same theme, Larson and LaFasto (1989) found that the confidence among team members in their efficacy is a critical factor to their effectiveness. Shea and Guzzo (1987) found potency related strongly with group performance. Bandura (1982, p: 143) added that "perceived collective efficacy will influence what people choose to do as a group, and determine their effort to produce performance". He also added that people with a sense of collective efficacy would be able to deal with external obstacles they face.

Guzzo *et al.* (1993, p: 102) argued that group effectiveness models with the input-process-output approach (for example: Hackman and Morris, 1975) can be enriched by adding the potency as group belief variable to enhance these models capacity to explain group performance. Guzzo *et al.* (1993) also argued that adding team potency in Sundstrom *et al.*'s (1990) team effectiveness model, which emphasised the contextual influences on

group performance, could be further enriched. Shea and Guzzo (1987) argued that potency is an immediate determinant of a group's effectiveness.

Edmondson (1999, p: 354) noted that trust among team members is an important variable for team beliefs and team effectiveness. She defined trust as "the expectation that others' future actions will be favourable to one's interests, such that one is willing to be vulnerable to those actions". She added that trust builds confidence among team members. Armer and Hsieh (1998) mentioned that team effectiveness is affected by trust among team members. Kiffin-Petersen and Cordery (1998) referred to trust among team members as horizontal trust as noted by Armer and Hsieh (1998) and added vertical trust. Vertical trust that referred to trust between management level and team members and that based on it management would allow more autonomy to team members to make decisions. They argued that both horizontal and vertical trusts were needed for team effectiveness. A study by Cordery (1996) concluded that a high degree of co-operation among team members depends on high level of trust among them. It was suggested that high trusting team members might be expected to be more accepting of self-management in teams and that this might contribute positively to team effectiveness. Bassin (1996) mentioned the importance of trust among team members that encourage honest and open communication among them and that this would facilitate their work.

2.4 Team effectiveness measures and criterion

2.4.1 Team effectiveness measures

Various team effectiveness measures had been suggested and developed by different writers. Brodbeck (1996 in West, 1996, p: 290) argued most of work group theories and models "incorporate what Campbell and Campbell, 1988 defines as effectiveness: the degree to which the performance outcomes approach the goal specified". He argued that the distinctions are drawn between productive output (e.g., sales), social criteria (e.g.,

satisfaction with the team and willingness to work together in future) and personal criteria (e.g., personal development and member satisfaction). In group effectiveness models, team effectiveness measured in terms of performance output for example in Hackman's model (1987), Gladstein's model (1984), Tannebaum *et al.* (1992) and Sundstrom *et al.*'s model (1990). In Sundstrom *et al.* (1990) the work group viability (which is the members' willingness to work together) was found to be an essential part of the effectiveness criterion. Sundstrom *et al.* (1990) added task completion as another effectiveness criterion. In Shea and Guzzo's model (1987) task accomplishment was found as the only significant part of the effectiveness criterion. Innovation in teams is another effectiveness criterion as suggested by West's model (1990) and by Agrell and Gustafson's model (1994). They argued that the quality and the quantity of innovation are effectiveness criterion. Team effectiveness output measures as found in team effectiveness models are presented in Table 2.2 below.

Team effectiveness output measures	**Team effectiveness models**
1. Performance outcomes team perceptions, team output quality and quantity	Hackman & Morris, 1975, Hackman & Oldham, 1980, Gladstein, 1984, Hackman, 1987, Sundstrom *et al.*, 1990, Tannenbaum *et al.*, 1992, Handy, 1993, Shea & Guzzo, 1987 and Cohen & Bailey, 1997.
2. Other outcomes team members satisfaction, group cohesiveness, attitude change, team innovation and behavioural outcomes (e.g., absenteeism and turnover)	Hackman & Morris, 1975, Hackman & Oldham, 1980, Gladstein, 1984, Hackman, 1987, Tannenbaum *et al.*, 1992, Handy, 1993, West, 1990, Agrell & Gustafson, 1994 and Cohen & Bailey, 1997.

Table 2.2 Team effectiveness output measures as found in team effectiveness models.

Some of these effectiveness measures used an objective judgement and others used subjective self-report measures and managers'-report measures. Cohen and Ledford (1994) assessed team effectiveness by measuring team performance with objective measures like absenteeism rate, team member's accidents or customer complaints and they also used a team manager's judgement. Katzenbach and Smith (1993) argued that observing team

behaviour and evaluating how they make decisions could be used as objective measures of team effectiveness. In a similar way, Sundstrom, De Meuse and Futrell (1990, p: 122) assessed team effectiveness based on team performance and team viability. Team performance in this case meant "acceptability of output to customer within or outside the organisation who receive team products, services, information, decisions, or performance events" and team viability meant "member's satisfaction and the group's future prospects as a work unit". Wagman (1995) assessed group effectiveness by measuring the group performance, motivation and satisfaction. In Campion, Medsker and Higgs's (1993) study an assessment of team effectiveness was obtained from objective measures such as records from the organisation and subjective measures such as self-perception of employees and observer perceptions. Guzzo and Dickson (1996) measured team effectiveness with output measures such as quality and quantity and customer satisfaction. Krager and Wenzel (1997, p: 79) argued that "team effectiveness can be measured in terms of tangible and intangible outcomes". These outcomes are product quantity and quality, costs, general productivity and time spent in work. They argued that team beliefs and norms among team members would affect team effectiveness measures. Cohen and Bailey (1997) concluded that half of studies employed objective measures of performance effectiveness such as satisfaction, outcomes and absenteeism rate, while some others employed subjective measures as perceptions of performance. They argued that using subjective measures appeared in about half of the studies. Edmondson (1999) measured team performance in her study by using subjective measures as originally developed by Hackman (1990) to obtain self-report measures on team performance outcomes.

Cohen and Bailey (1997) suggested that team effectiveness could be measured at different levels of the organisation; individual level; group level; unit level and organisational level. They categorised team effectiveness into three major dimensions according to the team`s impact on performance, members' attitudes and behavioural outcomes. Guzzo (1995)

stated that at an individual level of analysis, the emphasis was on team members' skills, psychological and behavioural processes. At a group level of analysis, the focus will be on pattern of interaction among the group such as members' co-ordinating their effort in work. The third level of analysis was a focus on the context or the environment in which teams work and their effect on group performance. Guzzo (1995) argued that the third level of analysis had received less attention in the literature compared with the individual and group levels of analysis.

There is a clear distinction between the three types of measures of team effectiveness (output, team development and individual satisfaction) and the influence upon team effectiveness (individual level, group level, unit level and organisational level). Cohen and Bailey (1997) stated that team effectiveness output (performance, attitudinal and behavioural) can be measured for the individual, the teams, the business units or the organisation level. Self-perception of team performance and managers' perception of team performance were used as measures of output, in half of the work teams, as subjective measures. However, in the literature, the work team performance outcomes, team performance effectiveness, team effectiveness, group performance, group effectiveness were used in different studies to indicate the same meaning. Therefore, in the current study the term 'team performance' and 'team effectiveness' will be used interchangeably when reviewing previous literature, however, in the empirical and subsequent work the term team performance will be used as an indicator of team effectiveness.

2.4.2 Team effectiveness criterion

Hackman and Oldham (1980, p: 168-169) provided three criteria of group effectiveness. These criteria are whether "(i) the productive output of the work group meets or exceeds organisational standards of quantity and quality, (ii) the group experience serves more to satisfy than frustrate the personal needs of group members, and (iii) the social process used

in carrying out the work maintains or enhances the capability of members to work together on subsequent team tasks". Hackman and Oldham (1980, p: 169) identified three intermediate criteria of team effectiveness, which related to the success or failure of a team. These criteria are "(i) the level of effort that group members bring to bear on the task, (ii) the amount of knowledge and skill applied by group members to task work, and (iii) the appropriateness of the task performance strategies used by the group in doing its work".

To create conditions which favour the achievement of the intermediate criteria, Hackman and Oldham (1980, p: 171) argued for the need of three features of the basic design of the group, which are " (i) the design of the group task, (ii) the composition of the group and (iii) the group norms about performance process". They argued that he design of the group task required the group members to have skill varieties, task identity, task significance, autonomy and feedback to do their work effectively. Also the group should include members who have high levels of task relevant expertise, the group should be large enough to do the work, but not too large, the group should have a moderate level of interpersonal skill with a mix of team members roles to work effectively.

2.5 Discussion

It can be concluded from the previous models of team effectiveness reviewed above that there are some significant determinants of team effectiveness (for example; Shea and Guzzo 1987, Hackman and Morris, 1975, Hackman and Oldham, 1980, Gladstein, 1984, Hackman, 1987, Handy, 1993, Sundstorm *et al.*, 1990, Tannenbaum *et al.*, 1992 and Agrell and Gustafson, 1994). These models used a variation of the input-process-output and reciprocal interdependence frameworks for analysing teamwork effectiveness. Reciprocal interdependence for example in Sundstorm *et al.* (1990, p: 122) meant, "one indicates that boundaries influence effectiveness, which alter the boundaries, which further influence

effectiveness". There are some variations among them in the way each variable is categorised in their models. On the other hand, Cohen and Bailey (1997) argued that their team effectiveness model moved away from input-process-output approach to focus on the design factors that have the major effect on team effectiveness. They also indicated some other factors in their model like group process and psychosocial traits, which are important in determining team effectiveness. These determinants of team effectiveness, which resulted from the examination of different team effectiveness models which are supported by some empirical studies can be categorised as concerned with: (1) design factors (team autonomy, team size, team heterogeneity, team reward, team vision and shared goals, team organisation support, team psychological safety, team leader behaviour and team culture); (2) team members' behaviour (team members' roles and styles, team characteristics and gender composition); and (3) team beliefs.

Team effectiveness tend to be measured in the previous team effectiveness models by focusing on team performance outcomes such as team perceptions, team output quality and quantity (for example; Hackman and Morris, 1975, Gladstein, 1984, Sundstrom *et al*, 1990 and Cohen and Bailey, 1997) and other outcomes such as team members' satisfaction, team changes, team innovation, team absenteeism and labour turnover (for example; Hackman and Oldham, 1980, West, 1990 and Cohen and Bailey, 1997).

Some variables have been seen by some authors to have the same influence on team effectiveness. For example: Edmondson (1999) argued that team psychological safety goes beyond team trust; she argued that both of them have the same effect on team effectiveness. Task interdependence had been found by Sprigg *et al.* (2000) to be related with the degree of autonomy that is given to team members. Some authors considered it as a necessary condition for semi-autonomous work group.

Team members' roles, preferences and the styles that team members should play in their team are essential factors in determining team effectiveness (Belbin, 1981; Margerison and McCann, 1985 and Parker, 1990). It seems similar to the arguments put forward by other writers on team effectiveness that the interaction among team members (such as communication, conflicts, beliefs, shared understanding, norms and cohesiveness) may be predicted from team player styles. In Handy's group effectiveness model (1993) attention was given to the importance of the team members' mix to perform different roles as suggested by Belbin's team roles. West (1994) argued for the important role of team members' role types as identified by Belbin and raised the importance of the balanced mix of team members for team effectiveness. Guzzo and Shea (1992) argued that work interdependence had an effect on team effectiveness, which is similar to team player styles' idea that means the team members must interact and depend on each other to accomplish their tasks. Also, a balanced mix of team members with different skills and different characteristics will affect team effectiveness. Therefore, it can be argued that team effectiveness is a function of team player styles as well as being a function of team design factors.

From the literature there still are some questions raised which require answers. Sundstrom *et al.* (1990) raised questions such as: (1) what mix of individual traits effect team effectiveness?; (2) in what team size effectiveness can be the greatest?. In their study Sundstrom *et al.* (1990, p: 126) mentioned as well that "group composition has seldom been studied in actual work teams, despite evidence of its importance". Goodman *et al.* (1986) also argued that the relationship between composition and team effectiveness might hinge on other issues like heterogeneity of task abilities or specialities.

Manz and Sims (1987) and Cohen *et al.* (1996) noted that there is no evidence found to support the link between the leader behaviour and team performance although the literature

referred to its importance. Guzzo and Dickson (1996, p: 331) asserted that "there is a real need to develop theory and data on the ways in which dissimilarity among members contributes to task performance". They also argued for the importance of examining teams in 'naturalistic settings' in the organisations because this would be related to the influence of team environment aspects such as reward and information system.

Bandura (1982) argued for the importance of linking the measures of perceived group efficacy with group performance. He also argued for the need to develop suitable tools for measuring group' perceptions of their efficacy. Guzzo *et al.* (1993) argued that little attention had been found on research on potency and referred to the need to investigate the effect of potency in-group effectiveness models in naturally occurring settings. Lindsley *et al.* (1995) stated that most of the research attention was given to the individual level of self-efficacy. To deal with rapidly changing environment, Bandura (1982, p: 143) suggested the need of "skilled people with high sense of collective efficacy that will help to shape the direction of their future environment". Gibson (1999) argued that the organisation culture could affect the relationship between efficacy and performance. He argued for future research to investigate that relationship.

There are also some limitations of team effectiveness models as described by West (1996, p: 556), which need more work. He argued "each model presents a generalised description of work group effectiveness which as Hackman and Morris (1975) suggested, may be inappropriate". West (1996) also argued these models attempt to be applicable across diverse work groups, therefore, these models are complex in terms of the large number of variables included to explain a conceptual framework (for example, in Hackman's model the variables are 14 and in Sundstrom *et al.*'s model, there are 17 variables). Therefore, West (1996, p: 557) argued that investigating and testing team effectiveness models is "very challenging for researchers". He added that further research needed in work group

effectiveness within context-specific theoretical approaches. Cohen and Bailey (1997, p: 280) stated further team effectiveness studies need to "select variables to be studied not because they have been traditionally studied, but because they help us to understand the effectiveness of different types of teams".

2.6 Summary

This chapter has examined different team effectiveness models that identify essential factors for enhancing team effectiveness in organisations. It also focused on some previous literature related to the same subject that produced various other factors contributing to team effectiveness. Conclusions were drawn from team effectiveness models and from previous literature, which focused on essential factors that would facilitate team effectiveness. The next chapters will focus on team player behaviour and team design variables that are argued from the literature as important determinants of team effectiveness. In examining the previous literature common factors related to team effectiveness would help to propose a framework for team effectiveness in Egypt that can be tested in the Egyptian organisations that use teams.

Chapter Three

Team behaviour models

3.1 Introduction

Swailes and Senior (1996) argued that the concept of team role has a long history and has become an important factor in organisational structures, empowerment and teamwork. Likert (1961 in Senior, 1997, p: 241) observed the idea that everyone is a part of one or more teams, and noted that the team member's performance within organisations is an important variable in the performance of the organisation as a whole. In addition, the team members' abilities, skills and behaviours are related to the roles that they play. Belbin (1981) studied the composition of teams, according to various hypotheses and research designs and explored the importance of team members' characteristics, personalities and abilities that contribute to a team's performance and its effectiveness. Margerison and McCann (1985) argued that high performing teams need a mix of skills to deal with the demands of each situation in the workplace.

Moreover, Parker (1990) noticed that team effectiveness depends on team players' characteristics in each team. He also added that the effective team consists of an appropriate mix of people, who perform in a variety of styles in their teams. Fowler (1995) noted that even if a team's members had all the necessary knowledge and skills, this does not guarantee its success. Fowler (1995, p: 40) added, "it is serious mistake to assume that there is a single type of 'team person'. What is needed is a mix of types". Fowler (1995) argued that team members should work together effectively to guarantee its success. Campion, Medsker and Higgs (1993) noted that effectiveness of a work group related to the characteristics of job design, interdependence between team members, organisational context, team process and team composition. Campion, Papper and Medsker (1996) supported the findings of Campion, Medsker and Higgs (1993) and added that the inter-relationships between the roles occupied by the team members are important determinants

of team effectiveness. The current literature review revealed a number of models of team behaviour that assess the individuals' behaviours in group settings, for example Belbin (1981), Margerison and McCann (1985) and Parker (1990).

The aim of this chapter is to examine team behaviour models and to evaluate the important role of the mix of the team player styles in performing the tasks, which may lead to effective team performance. The next part examines each model, the various measurement tools and the psychometric properties of these measurements. Baker and Salas (1997) stated that psychometrically sound construct valid measures would provide indications of the extent to which these measures are effective, which are important for the external validity of their findings.

3. 2 Team behaviour models

Different writers have identified a number of team behaviour models. Belbin's team-role model, Margerison and McCann's team role preferences and Parker's team player styles are the three widely cited models found in the literature. Belbin (1981) identified nine team roles, Margerison and McCann (1985) identified eight team roles and Parker (1990) identified four team player styles. Senior (1997) noted some overlap between different sets of roles, but also observed that there are roles that seem to be unique to each model. For each model the psychometric properties of the various research instruments will also be examined.

3.2.1 Belbin's Team Role Model

Swailes and Senior (1996) stated that amongst the many team roles theories Belbin's (1981, 1993) has become popular in management because of its simplicity and because an

individual's most natural team roles are easily identified through the Belbin Team Role-Self-Perception Inventory (BTRSPI). Belbin's team roles model is based on studies of the working habits of various teams at the Industrial Training Research Unit in Cambridge and also from the work at Henley Management College in UK. Belbin noticed that some teams outperform others. Belbin used three well-known tests that have been used to assess the behaviour differences in management field to identify the team member who was common to successful teams. Belbin used 16 Personality Factors Questionnaire (16PF), Critical Thinking Appraisal (CTA) and the Personality Preferences Questionnaires (PPQ). Belbin argued that teams perform better when the team style matches the demand of the task. Based on that he identified eight team roles that team member should play in the team. In his BTRSPI new version he identified nine team roles. Belbin argued that a balance of team roles would lead to better outcomes from the team members (Sadler-Smith, 2001). Belbin (1981, p: 169) defined a team role as "a pattern of behaviour characteristic of the way in which one team member interacts with another so as to facilitate the progress of the team as a whole". Belbin (1993, p: 24) referred to a team role as "a tendency to behave, contribute and interrelate with others at work in certain distinctive ways". Table 3.1 presents Belbin's team roles.

Roles	Descriptions
Plant	Creative, imaginative and solves difficult problems.
Resource Invistigator	Extrovert, enthusiastic, communicative, explores opportunities and develops contacts.
Co-ordinator	Mature, confident, a good chairperson. Clarifies goals, promotes decision-making and delegates well.
Shaper	Challenging dynamic, thrives on pressure, encourages others to overcome obstacles.
Monitor Evaluator	Strategic and discerning. Sees all options and judges accurately.
Teamworker	Co-operative, mild, prospective and diplomatic. Listens, builds and averts friction.
Implementer	Disciplined, reliable, conservative and efficient. Turns ideas into practical actions.
Completer	Painstaking, conscientious, anxious. Searches out errors and omissions. Delivers on time.
Specialist	Single-minded, self-starting, dedicated. Provides knowledge and skills that are in rare supply.

Table 3.1 Belbin's team roles description. (Source: Belbin, 1993, p: 22)

The BTRSPI is an instrument that Belbin (1981) designed primarily to be used as a part of management development training programs. It was included as an Appendix in Belbin's book (1981). Balderson and Broderick (1996, p: 33) stated that Belbin argued that BTRSPI was not designed as a self-standing psychometric test, even though he claimed that "this is often how it is used by management consultants and trainers who may have very little understanding of psychometrics". The BTRSPI exists in two forms, a self-report form and an observer checklist form to be completed by the team members' colleagues. The inventory is divided into seven sections each with eight items totalling 56 questions; for each section the team member should distribute a total of ten points for each item amongst the responses that thought by him or her best describe their behaviour at work. The highest score indicates a team member's primary role in a team. The lowest score identifies possible areas of weakness.

Belbin (1981) referred to the importance of the balance of team roles, which defines in terms of characteristics in the team members, which are needed for a particular task. Belbin (1981, p: 77) added "what is needed is not well-balanced individuals but individuals who balance well with one another".

There are opponents and proponent of Belbin's team roles model to be found in the literature. Balderson and Broderick (1996) conducted comparative studies among 185 respondents from the health service, private and public organisations, who completed a BTRSPI during the period of 1993-1995. The research considered differences in team role preferences which may be related to occupation and gender. There was no significant difference found between team role preferences of doctors versus those of managers. The management teams within the health service that included doctors were more successful because they brought together complementary team-role preferences. This supported

Belbin's conclusions that effective teams occur when all team roles are presented within the team. Balderson and Broderick (1996) concluded that BTRSPI could provide useful insights into differences associated with occupation and gender. Swailes and Senior (1996) provided statistical evidence from 218 managers who participated and completed the BTRSPI to explore the independence of each of Belbin's team roles. Senior (1997) evaluated Belbin's team role model in the context of a range of management teams working within the public and private sectors in the UK in terms of their ability to predict team performance. She examined the idea that a team should be balanced in terms of members' team roles (both individually and averaged across the team) in order for the team to be highly performing and effective. All team members completed the nine-role version of the BTRSPI and also participated in interviews to collect data related to their teams' characteristics and performance. The results supported the concept that a balanced team of Belbin's team roles was associated with higher team performance. Senior (1997) argued that one area that had been given little attention was the use of the observer assessment.

The psychometric properties of the BTRSPI have been criticised. Furnham, Steele and Pendleton (1993, p: 245) argued that BTRSPI is used extensively in applied settings especially in selecting, consulting and developing management teams, "but has received comparatively little psychometric assessment or validation". They measured the properties of the original eight-role version of BTRSPI. The alpha coefficients for the eight roles were low, which ranged from 0.34 to 0.71 and the factor analysis did not support the proposed factor structure. They also added that BTRSPI is not the only measure that can be used to assess team role behaviour. They referred to the tool developed by McCann and Margerison (1985) to measure team roles that has eight types and appears to be heavily influenced by the Jungian theories, not just based on team members' preferences. Belbin (1993, p: 259) replied to the criticism of Furnham and his co-workers, who had examined

BTRSPI and "claimed that the inventory does not give confidence of having predictive and construct validity" as follows:

> "it should first be noted that the BTRSPI as a self-standing psychometric test does not exist, by which one means that this office does not market it for the purpose assumed and never has. The Team Role Self-Perception Inventory was included as an Appendix in a book describing a long period of experimental research into the effectiveness of management teams (Belbin, 1981). Psychometric tests were used in this research as predictors. But since the book was written primarily for the benefit of line managers the inclusion of a Do- It-Yourself inventory at the back of the book was considered a quick and useful way of intimating to readers what their own team roles might be. Evidently that intention was met, for the inventory attracted many users and played a major part in helping the book to achieve its peak sales nine years after its first year of publication".

Belbin (1993) also added that Furnham and his colleagues used internal consistency in examining the team roles, as if in examination of a fundamental personality trait. But Belbin argued that team roles are not traits but a pattern of behaviour characteristics of the way in which team members interact together to facilitate the progress of the team as a whole. Belbin added a team role was associated with a cluster of related characteristics combining to facilitate the presence of a role and not with a single trait. Therefore, according to Belbin there is little value to be gained in correlating the separate items of a cluster.

Furnham, Steele and Pendleton (1993) and Fisher, Maccrosson and Sharp (1996) also argued that the BTRSPI had weak psychometric properties. Senior (1998 in Sadler-Smith, 2001) explored the properties of BTRSPI. She concluded that the factor structure of BTRSPI was unsatisfactory. Also, Senior (1997, p: 245) noted that "no published test of the psychometric properties of the current nine-role version have been found".

Fisher, Macrosson and Sharp (1996) examined the test-retest reliability of BTRSPI for a sample of university students and also examined the team role scores derived from other instruments. The study examined the closeness of the match of team role derived from the BTRSPI with those derived from the 16 PF data. The result of the test-retest reliability of the BTRSPI was unsatisfactory, which supported the criticisms of Furnham *et al.* (1993). Fisher, Macrosson and Sharp (1996) argued that the size of the reliability coefficients raised a question as to whether Belbin's objective for the BTRSPI is achieved. The findings also demonstrated that there was no significant correlation between team roles derived from the BTRSPI and from the 16 PF questionnaire. They argued that The 16 PF was a better estimator of team role preferences than the BTRSPI, which supported the findings of Furnham and his co-workers.

In conclusion, the evidence from previous studies raised some serious questions concerning BTRSPI's internal consistency, construct validity and its temporal stability. Furnham, Steele and Pendleton (1993) suggested that there are some problems in BTRSPI such as: (a) it is an ipsative scale and there are many researchers who have pointed out some of the drawbacks of ipsative scales (for example: Johnson, Wood and Blinkhorn, 1988; Clemens, 1966; Hicks, 1970). They argued strongly against the use of ipsative scales for making comparisons between people. Baron (1996) pointed out that an ipsative scale is an ordinal measure that does not meet the criteria of standard psychometric properties; (b) the way that BTRSPI in which the questions are asked are arranged in a way that do not let the respondents specify the nature of their teams, which may lead to weak and poor reliability (Argyle, Furnham and Graham, 1981 in Furnham, Steele and Pendleton, 1993, p: 247); (c) BTRSPI had anticipated four factors (team leader, intellectuals, negotiators and manager-workers), but Belbin never explained the intercorrelations between these roles while, Furnham, Steele and Pendleton (1993) argued that when measuring the team roles, the

intercorrelations among the roles should be high; and (d) the internal reliability of BTRSPI was low and can be considered as inadequate (Furnham, Steele and Pendleton, 1993). They added also that BTRSPI has poor discriminant validity.

Belbin developed the Interplace system to solve some of the problems with the BTRSPI's psychometric properties. According to Belbin the Interplace is a computer-based Human Resource Management System that enables better decisions to be made about people. Interplace integrates data about people and jobs that are gained from self-perception, observer assessment, job requirement and observer evaluation. These will be the input in the computer and the output is advice in the derived from an 'expert system'. The Interplace has been translated into different languages and, according to the systems suppliers, is apparently used widely by the UK's top 100 companies (Sadler-Smith, 2001).

3.2.2 Margerison and McCann's Team Role Preferences

Margerison and McCann (1985) developed a model of team management founded on Jung's concept of styles. Jung's types resulted from a combination of four functions (thinking, feeling, sensation and intuition) and two attitudes (introversion and extroversion) to create eight behavioural types (Parker, 1990, p: 62). Margerison and McCann (1985) focused on team behaviours and team-role preferences. They focused on the major work functions and the major individual skills needed. They argued that their team management wheel is based on the required behaviours (exploring and controlling) and the role preferences (advisory or organisational) in any team. Margerison and McCann (1985, p: 16) stated that the team management wheel provides the "graphic description of the factors linked to the work functions described". Individuals' preferred roles on team management wheel could be determined by using Team Management Index (TMI) (p: 29-30). The TMI

consists of a 60 item self-report questionnaire in which the respondents were asked to respond upon four main aspects of managerial work: "(1) how do you prefer to relate with other people at work?; (2) how do you prefer to gather and use information?; (3) how do you prefer to make decisions?; and (4) how do you prefer to organise your-self and others?". On the basis of the results of the TMI, a personal profile may be developed, which describes the individual's work preferences, leadership preferences and strengths, the decision-making styles and interpersonal skills. Margerison and McCann (1985, p: 34) argued that "the profile indicate preferences not performance which can depend on other factors such as adequate rewards, a challenging job, good supervision and so on", which would affect the individuals' motivation and commitment to performing well at work.

Margerison and McCann (1985, p: 18) noted that the TMI is a tool that can be used in consultation to help managers with their team members to "get the right balance from the players and to ensure people play in positions where they can use their strengths and co-operate with each other". They referred to the use of a computer-based version to generate a personal profile for each team player, which describes the individuals' work preferences, their relationships and their decision-making styles. Margerison and McCann (1985) identified eight team role preferences and added the role of the linker. These roles are presented in Table 3.2. The linker role requires a manager or a supervisor to link individuals within the team and to link them with other units in the organisation. The effective linker must be skilled to help the team to solve their problems, to develop a balanced team to ensure its success.

Role	Descriptions
Reporter-Advisers	Support, collect, disseminate the information and resources.
Creator-Innovators	Generate new ideas.
Explorer-Promoters	Publicise new ideas, bring in new resources, make contacts and chart pathways.
Assessor-Developers	Identify practicing of ideas and assessing viability of proposals.
Thruster-Organisers	Set up systems, procedures, work allocation and assure the time and outputs are set right.
Concluder-Producers	Complete and finish the work.
Controller-Inspector	Inspecting and controlling the work.
Upholder-Maintainaners	Upholding and establishing cultural traditions and established ways of doing things.
Linkers	Co-ordinate and integrate team members within the team and is a team representative in front of others.

Table 3.2 Maregerison and McCann's team roles description. (Source: Margersion and McCann, 1995, p: 16-17).

Sadler-Smith (2001) noted that Margerison and McCann provided data on the psychometric properties of TMP. The TMP showed high internal reliabilities for each of the four scales, all over 0.70. The test-retest reliability indicated stability over time. Sadler-Smith (2001) also added that TMP had been translated into different languages and the internal reliabilities of the translated measures were satisfactory as the original one. Sadler-Smith (2001) reviewed different studies explored the construct validity of TMP through an examination of their instrument with the Myers-Briggs Type Indicator MBTI (Briggs and Myers, 1957), 16PF (Cattell, 1966), BTRSPI and Learning Style Questionnaire LSQ (Honey and Mumford, 1992). The results indicated the independence of TMP and MBTI, while there some relationships found between team roles and learning styles as measured by LSQ. There are some relationship between TMP and the 16 PF. Sadler-Smith (2001) noted that there is no published research into the factor structure of TMP, and noted that it is an ipsative test, therefore, some drawbacks like those for the BTRSPI may be found.

Rae (1990 in Sadler-Smith 2001) provided an assessment of the TMP's effectiveness in an applied setting. Rae (1990) stated "TMP was a valuable managerial resource in that it allowed: (i) the balance of existing teams to be used; (ii) the identification of role preferences upon which individuals may need to develop; (iii) the opportunity for the notions of team roles and learning styles to be linked to enable a deeper understanding of individual and team learning process; (iv) the development of interactive and interpersonal skills by increasing participant's awareness of behaviours, motivations and needs of themselves and other team members". Hence the TMP appears to have both psychometric validity and practical value.

3.2.3 Parker's Team Player Styles

Parker's team player styles is based on Jung's theory of personality types. Jung's types resulted from a combination of four functions (thinking, feeling, sensation and intuition) and two attitudes (introversion and extroversion) to create eight behavioural types (Parker, 1990, p: 62). Parker (1990, p: 63) noted that the Myers-Briggs Type Indicator (MBTI) is an instrument that "has been extensively validated and is widely used" to classify people according to Jungian types. He argued that "it was developed primarily as an aid in counselling, it has not been as useful in management and team development". Parker (1990, p: 63) also noted that there are other style-based instruments, which have been developed but they just focused "on styles of decision making, leadership, and interpersonal relationships. But no research-based instruments focus on team player styles".

Parker (1990, p: 16) defined a team as "a group of people with high degree of interdependence geared towards the achievement of a goal or completion of a task". He also identified twelve characteristics to distinguish between effective and ineffective teams.

These characteristics are clarity of purpose, informality, participation, listening, civilised disagreement, consensus decisions, open communication, clear roles and work assignments, shared leadership, external relations, style diversity and self-assessment. Parker (1990, p: 33) referred to the importance of style diversity that means "a broad spectrum of team player types including members who emphasise attention to task, goal setting, focus on process, and questions about how the team is functioning". Parker (1990, p: 63) argued that there are four team player styles can be found for each team player in a team which "contribute in different ways to the success of the team, and each style has a downside when carried to an extreme". The four styles are contributor, collaborator, communicator and challenger. These styles presented in Table 3.3.

Style	Descriptions
Contributor	Task-oriented; provides technical data and dependable.
Collaborator	Goal-oriented; a big picture person.
Communicator	Process-oriented; effective listener, facilitator; solve conflicts; give feedback and consensus building
Challenger	Question-oriented and risk taking.

Table 3.3 Parker's team player styles description. (Source: Parker, 1990, p: 63-64)

Parker (1990, p: 63-64) defined the four team player styles as follows: "a contributor is a task-oriented team member who enjoys providing the team with good technical information and data, does his or her homework, and pushes the team to set high performance standards and to use their resources wisely. Most people see the contributor as dependable". A collaborator is "a goal-directed member who sees the vision, mission, or goal of the team as paramount but is flexible and open to new ideas, is willing to pitch in work outside his or her defined role, and is able to share the limelight with other team members. Most people see the collaborator as a 'big-picture' person". A communicator is "a process-

oriented member who is an effective listener and facilitator of involvement, conflict resolution, consensus building, feedback, and the building of an informal, relaxed climate. Most people see the communicator as a positive people person". A challenger is "a member who questions the goals, methods, and even the ethics of the team, is willing to disagree with the leader or higher authority, and encourages the team to take well-conceived risks. Most people appreciate the value of the challenger's candor and openness".

Parker (1990) argued that the four team player styles are needed in the four team development stages that were identified by Tuckman (1965). These stages are forming, storming, norming and performing. Parker provided a link between each stage of team development and the team player styles. Parker (1990, p: 113) argued that "team players have an important role to play in each stage". He added that in the forming stage when a new team starts or an existing team reforms the contributor style is needed to discuss team tasks, provide information or opinion and provide direction to team members. The collaborator style is needed to provide the team with the purpose and create team mission and suggest team develop goals. The communicator style is needed to encourage the personal interaction with all team members. The challenger style is needed to be sure that the team achieves useful things related to team's purpose and mission. In the storming stage, the contributor is concerned with the need to achieve an objective, examine team problems and encourage team members to look at different points of views in all issues. The collaborator style is concerned with the team's need to see the global picture. The collaborator style can be willing to help others and ask for new ideas in a team. The communicator style is needed through the storming stage to help understand the conflict in opinions among team members and express it in a positive manner and help to establish effective norms. The challenger style pushes the team members to explore their limits and to consider their innovative aspects of their problems. In the norming stage, as positive

norms had been established, a contributor insists on high quality standards for all team outputs, help team members to use their technical resources effectively, allocate assignments among team members, and get tasks done. The collaborator encourages the team to focus on the 'global' picture of work, encourages team members to commit to the team's missions and goals. The communicator style is needed to establish a positive team climate to increase trust and solve conflicts. The challenger style is needed to encourage risk taking in the team's decisions and planning. In the performing stage when there is an agreement on goals, roles and norms among team members, they are working towards achieving their goals. The contributor style is needed to be sure that the skills and resources of the team are sufficient to meet the new challenges. The collaborator style is needed to look for opportunities to extend their goals or mission. The communicator style is needed to facilitate and ensure that team members are involved in the task. The challenger style is needed to address the possible satisfaction of team members and discuss the internal and external changes and their impact on team and teamwork.

Parker (1990, p: 96) developed the Parker Team Player Survey (PTPS) to help identify each person style as a team player. He defined the PTPS as "a self-assessment instrument that defines the team player styles and the potential weaknesses". It is a form of self-feedback on a person's perception about himself or herself. Parker argued that the results from PTPS would "lead to an assessment of the persons current strengths and provide a basis for a plan to increase his or her effectiveness as a team player".

Parker suggested that teams might use the (PTPS) to develop a profile of team strengths and to discuss strategies for increasing team effectiveness. The PTPS consists of eighteen statements; each statement has four possible endings that describe aspects of team

behaviour of the four team player styles. For example; during team meetings, I usually: (a) provide the team with technical data or information; (b) keep the team focused on our mission or goals; (c) make sure everyone is involved in the discussion; and (d) raise questions about our goals or methods. Every team member should rank the endings according to how he or she feels about his or her function as a team member rather than how they used to be or how they would like. The statement most like them is ranked four and least like them ranked one. The highest number indicates the person primary team player style, which means the behaviour that a person uses most often as a team member. This does not mean that it is the only style he or she uses. The lowest total number indicates the person least active team player style.

Concerning the scale's psychometric properties, Parker does not offer any test. Sadler-Smith (2001, in press) stated that "an interrogation of the *Social Science Citation Index* revealed a single paper by Kirnan and Woodruff, 1994, that examined the properties of the Parker Team Player Survey". Kirnan and Woodruff (1994) estimated the psychometric properties of PTPS by using undergraduate students and business samples. Acceptable test-retest reliabilities for all four team player styles were found. The test-retest reliability for the students' sample ranged from 0.53 to 0.75 and for the business sample ranged from 0.51 to 0.71. Low internal consistency for the collaborator style (0.43) and the challenger style (0.51- 0.53) were found. The internal reliabilities for the students' sample ranged from 0.20 to 0.65 and from 0.26 to 0.59 for the business sample. No significant differences were found for the students' samples or business samples in the reliability. Kirnan and Woodruff (1994) assessed the construct validity of PTPS by using a panel of students in an item sorting exercise, which showed good agreement for all four team player styles, except the collaborator style. The validity of PTPS was measured through a comparison of active teams within a variety of organisations. Kirnan and Woodruff (1994, p: 1034) stated that

"the Pearson Product Moment correlation coefficients calculated between the self-peer score are ranged from 0.18 to 0.46, but it was statistically significant although the correlation for the collaborator style was low". As a result of the assessment of PTPS's psychometric properties Kirnan and Woodruff (1994, p: 1036) argued that "PTPS (Parker, 1990) may be a useful measure for conducting research in the area of team styles".

3. 3 Balanced team

Brown (1991, p: 17) argued that at the basis of "Parker's thinking seems to lie a belief that the business world of the 1990s has grown so complex that no one person-no matter how bright or sharp-can grasp or manage it all". Roberts and Fusfeld (1981) noted that an appropriate mix of different characteristics is required to have an effective team. Hardingham and Royal (1994) argued the balanced team might include at least one individual who has a strength in each of the necessary team activities, and will not include too many of a particular type. The idea of a balanced team had been associated with the team behaviour models developed by Belbin (1981), Margersion and McCann (1985) and Parker (1990). They argued that balanced teams are more effective than non-balanced teams. Belbin (1981) and Margersion and McCann (1985) argued for the importance of the team size to determine the sufficient size that encompass the required range of skills for the appropriate mix of team roles.

Common agreement among writers had been found on the importance of the mix of characteristics among team members. Belbin (1981, p: 77) argued that the balanced teams need "individuals who balance well with one another" this was in terms of the characteristics and skills needed for certain roles in a team. Margersion and McCann (1985, p: 58) argued that team should be balanced "in terms of the work and team

activities undertaken". Unbalanced teams mean too many team members of the same kind working together that may lead the same work functions so as not to be very effective. They argued "teams fail because they are unbalanced". They also added that teamwork requires different people who play different roles for the right balance of team members to ensure the team success. Parker (1990) argued for the importance of the effective mix of people to ensure team effectiveness.

Belbin (1993) also linked the balanced teams with high performance in accomplishing complex tasks and missions. Senior (1997) noted that determining a balanced team by establishing team members' profile was the most common method used in the literature. Senior (1997, p: 246) argued that the balanced team "occurs when the team's average scores on each team role (taking all team role scores into account) are found to be similar". She argued that this measure "is not commonly found in the literature". She suggested that on average the team role characteristics might suggest a degree of balance although the team members may not present one or more naturally occurring roles. She also argued for the cause and effect relationships between the team roles' balanced and team performance. Belbin (1981) identified a team role profile for each team member and argued that balanced teams occur when all team roles are presented across the team profile. He also argued for the use of a balanced team mix to predict the high performance team. According to Belbin the roles that predominate on most occasions are consistent with team members' natural roles. He also argued for the need to have balanced teams by spreading the naturally occurring team roles across the team. Belbin added to determine the balanced teams a team members' profile should include all team roles for the team. Senior (1997) argued that to have balanced teams the average of team role scores can be used and these scores should show little variation from one another.

Margersion and McCann (1985, p: 71) introduced the concept of high performance teams (HPTs). HPTs were described by them as: (1) teams that set and achieve high output targets; (2) teams with a high degree of job satisfaction; (3) teams in which team members co-operate well together and respect each other roles that they play in a team, (4) teams with a high degree of autonomy to manage and organise their work and make their own decisions and (5) teams that learn from their mistakes and have high problem solving skills and regularly review their performance. Margersion and McCann (1985) argued that "HPTs are well balanced with respect to the roles people play in relation to their skills". Margersion and McCann (1985, p: 62) added that HPTs have "a range of people with complementary preferences rather than a group of people with similar work preferences". TMI is developed by them to measure people's work preferences and identify how to build a balanced team. Margersion and McCann (1985, p: 62) argued to have a balanced team a linking function role is needed to co-ordinate the work of a team.

Parker (1990) added that the balance of team player styles is related to the team development stages and argued that the four team player styles are needed in the four stages. Parker (1990, p: 127) argued that "the most effective teams have a balance of team-player styles". The balanced teams are concerned with high quality outputs, achieving the goals with a degree of commitment, ensure a positive team climate and questioning the team's goals and methods. He identified the balanced teams as "having the capability to use the various styles when required by the team".

Central to the balanced mix of team player styles is the idea of overload of style or styles and missing perspectives (absence) of style or styles in a team. Parker (1990, p: 129) stated "when a team has many people with the same primary style and excludes other styles, the

result is an excess of team strength in one area". On the other hand, Parker (1990, p: 131) stated that missing perspectives means "the one style that does not exist with any degree of strength". Parker (1990) argued that the absence of any style might lead to decreased effectiveness, missed opportunities, poor use of resources and may cause dissatisfaction among team members. While, he also added the overuse of styles would lead to an unbalance of team player mix and this may lead to team ineffectiveness.

3. 4 Discussion

It can be concluded that there is extensive research available on Belbin's team roles model, while the same is not true in respect of Margerison and McCann's team role preferences model and of Parker's team player styles model. However, the evidence from the literature indicated that both Margerison and McCann's and Parker's models are based on Jung's theory of personal style, while Belbin's team role model is based on preferred team members' roles. There are similarities that have been found between Belbin's and Margerison and McCann's team role models in the way they analyse the description of the team roles that are used to explore team performance and team balance.

Senior (1997) argued that there is a lack of published research data for team role models and on the same theme, Sadler-Smith (2001) examined the three behaviour models and argued for the need for future researches on all of them. Sadler-Smith (2001) stated that Parker does not provide any data on the PTPS properties. He argued that concerning PTPS "future research should explore the detailed psychometric properties of each of the four scales and the instrument's factor structure using exploratory and confirmatory techniques". For TMP Sadler-Smith (2001) noted "the TMP has shown acceptable levels of internal consistency" and he also added, "he is unaware of any research, which has

successfully reconstructed the instrument's hypothesised factor structure". The BTRSPI is used widely in applied settings, its psychometric properties have been examined by different researchers (for example: Furnham *et al.*, 1993) who raised some questions, which remain unresolved even after Belbin developed the Interplace that he claimed that would overcome some limitations of his original version (Sadler-Smith, 2001). Furnham, *et al.* (1993) also argued that Belbin's factor structure failed to reconstruct the grouping of scales suggested by Belbin. Sadler-Smith (2001) noted that the PTPS, like BTRSPI, is an ipsative scale, therefore, the same drawbacks of ipsative scales can be found with Parker scale. Sadler-Smith (2001) also argued that "research may wish to consider the development of a non-ipsative form, thus avoiding many of the potential difficulties associated with the factor analysis of ipsative items". Senior (1997) argued that little attention had been given to the use of the observer assessment. Sadler-Smith (2001) added the importance of the "combination of self-report and observer-assessment using commensurate scales is one way in which reliability and validity of assessment may be optimised" (in press).

Examining the psychological properties of BTRSPI, TMP and PTPS indicated that some limitations are still unresolved and further research is needed. Senior (1997, p: 256) stated "there is a need to continue to test Belbin's framework in order to produce increased reliability for the results reported here, more studies are needed to evaluate other theories of team roles, with the outcome of debating the notion of team role itself". Senior (1997, p: 245) noted "no published test of the psychometric properties of the current nine-role version have been found". Parker (1990, p: 63) argued "no research-based instruments focus on team player styles". Kirnan and Woodruff (1994, p: 1036) supported the use of

PTPS and recommended that "PTPS may be a useful measure for conducting research in the area of team styles".

It seems that there are still some limitations and unresolved questions related to the team behaviour models and further research is indeed needed. It would appear that an examination of the psychometric properties of the team behaviour models is an important factor that provides a degree of validation of these models. Whilst there are weak psychometric properties for BTRSPI and no support for its factor structure, for Margerison and McCann's team role preferences there is a need for future investigation into the underlying structure and its validity. The TMP is a good measure according to the literature but it is long, complex to score and costly to use. Little is known about Parker's team player styles model and there is one study found examining its psychometric properties, while there is no research found examining its factor structure.

Little attention has been given to PTPS despite the importance of the team player styles concept. It can be concluded that testing Parker Team Player Style's psychometric properties and its underlying factor structure in real setting is an important issue for many reasons. It is based on a theory of personality and it focused on the team members' styles not just their preferences. Kirnan and Woodruff (1994) recommend the use of PTPS in the future in the area of team styles. Because there is no other study found in the literature examining PTPS, it would be thought that testing the PTPS would add knowledge to the psychometric properties and allow a further comparison with BTRSPI and MTP. PTPS is also simpler to administer than BTRSPI and TMP. The PTPS model is simple and easy to score and it is cheap compared with the TMP.

3.5 Summary

This chapter has examined different team behaviour models and examined their relationship with team performance in organisations in the literature and discussed the notion of balanced teams and its relationship with team performance and team effectiveness. It is also focused on previous literature that examined each model's psychometric properties. Conclusions were drawn from the literature focused on the need to investigate the psychometric properties and the underlying structure for each model. Team player styles has been seen as an important factor that had been studied among many other team effectiveness models as well as among team behaviour models. In team effectiveness models, the effect of team player styles on team effectiveness was examined under different labels in each model. These labels are: team characteristics (Hackman and Morris, 1975); team members interaction (Hackman and Morris, 1975); team roles and cohesion (Sundstrom *et al.,* 1990); task interdependence (Shea and Guzzo, 1992 and Cohen and Bailey, 1997); group psychosocial traits (Cohen and Bailey, 1997) and internal process; communication and conflict among team members (Cohen and Bailey, 1997).

Studying the team player styles based on the team behaviour models and integrating it with the team effectiveness models might help to understand and enhance team effectiveness in the work place. The next chapter will focus on the team design variables that are drawn from the literature and which have been argued to be important predictors of team effectiveness.

Chapter Four

Team design variables

4.1 Introduction

Team effectiveness models emphasises the importance of team design variables as determinants of team effectiveness (Hackman and Morris, 1975, Hackman and Oldham, 1980, Gladstein, 1984, Hackman, 1987, Sundstrom *et al.*, 1990, West, 1990, Agrell and Gustafson, 1994, Tannenbaum *et al.*, 1992, Handy, 1993 and Cohen and Bailey, 1997). Team design variables were studied in these models under different categories and sometimes with different labels. As discussed earlier in Chapter Two, Hackman and Morris (1975), Hackman and Oldham (1980), Gladstein (1984) and Hackman (1987) studied the effect of team design variables by focusing on the group size, group structure and group reward. In the Sundstrom *et al.'s* (1990) team effectiveness model, the focus was on the organisational context such as autonomy, reward recognition, team vision and task design. Agrell and Gustafson (1994) focused on some team design variables such as reward, leadership support, team vision. Tannenbaum *et al.* (1992) drew the attention to some design variables such as work structure and organisational characteristics. Handy (1993) focused on team size, team leader style as design variables. Cohen and Bailey (1997, p: 245) drew an attention to the design variables and their influence on team effectiveness, they argued that design variables "are the major points of leverage for influencing team effectiveness". West (1996) and Cohen and Bailey (1997) argued for selecting variables to be studied from team effectiveness models to understand the effectiveness of each team type. Cohen and Bailey (1997) suggested different predictors' variables for each team type for team effectiveness. They used the same classification presented in their team effectiveness model to suggest the different predictors' variables for each team type. Cohen and Bailey (1997) suggested task design variables (team autonomy, team interdependence), group composition design variables (team size and team diversity), organisational context design variables (team reward and team supervision) are the predictors for the work team type. The Egyptian pilot survey of different manufacturing and services organisations that

used teams (Chapter One) indicated that the most commonly used team type is the work team. Therefore, in this chapter, team design variables are examined based on the classification that is presented by Cohen and Bailey (1997) in their team effectiveness model as predictors of team effectiveness for the work team type.

The aim of this chapter is to examine the literature on team design variables and their effects on team performance and team effectiveness. It will examine these variables as described in the literature and will look at the appropriate measures with an examination of their psychometric properties. A conclusion can be drawn from these variables related to the importance of testing the design variables in the proposed team effectiveness model in Egypt.

4.2 Task design variables

The results from the previous literature revealed the importance of autonomy and independence/interdependence as fundamental factors as key job characteristics (Griffin, 1981; Sutton and Rouseau, 1977). Some overlap may be found in the literature in explaining the effect of autonomy and independence/interdependence on performance. Sprigg, Jackson and Parker (2000, p: 1521) stated that interdependence means "the extent to which group members must interact and depend on each other in order for the group to accomplish its work". Hackman and Oldham (1975) and Sims, Szilagyi and Keller (1976) included worker independence from others as a part of their definition of autonomy. While Turner and Lawrence (1965 in Breaugh, 1985, p: 553) stated that they "did not see working independently of others as necessarily being autonomy". The findings from the literature suggested that autonomy is associated with independence in its effect on performance, satisfaction and absenteeism rate. Wageman (1995) found better performance and higher satisfaction among team members when there was a match between interdependence and

design characteristics of work groups. The results also indicated that individuals' autonomy preferences did not moderate the effect of task and reward interdependence, but individuals' autonomy was influenced by the amount of interdependence in the work. Liden, Wayne and Bradway (1996) found a positive impact on task interdependence on the relationship between group empowerment and performance. They suggested that matching group empowerment and task interdependence lead to the achievement of high levels of performance among groups. Janz, Colquitt and Noe (1997) investigated how autonomy, interdependence, and team development, along with process and contextual support variables, were related to the effectiveness of teams of knowledge workers. The results suggested that interactions among design, process, and contextual support factors had important implications for team effectiveness. There was positive relationship between team autonomy and team job motivation and it was reduced as teams worked under more interdependent conditions. Kiggundu (1983) found a strong effect of autonomy and interdependence on job satisfaction in a sample of employees in a life assurance company.

As was discussed in Chapter Two, Sprigg, Jackson and Parker (1997) stressed the importance of interdependence as a contextual variable and they looked at it as a salient issue within one area where team work found because people predominantly worked as individuals on unrelated tasks. They argued that technology is an important determinant of interdependence. Sprigg and Jackson (1998, p: 2) argued that "interdependence is an important pre-requisite for successful team-work". Sprigg *et al.* (1997) suggested that low work interdependence is an inappropriate context for team working. They argued that interdependence found to be accounted for the differences between successful and unsuccessful teams. Oldham (1996, p: 1, in Sprigg *et al.,* 1997) argued that "job design research had overlooked the physical context in which the work is performed, which could be particularly salient in relation to teamworking". He also argued that "the emphasis in job

design studies has been on employees who work as individuals with a distinct lack of corresponding field research on teamworking". While some researchers such as Breaugh (1985) and Kiggundu (1983) argued for the importance of distinguishing between autonomy and interdependence, Kiggundu (1983) added that although autonomy and interdependence might be in some cases empirically related they have distinct dimensions. Therefore, Breaugh (1985) argued that each construct should be measured separately.

Therefore, with the aim of examining the effect of task design on team effectiveness, autonomy has been chosen to be tested separately. As mentioned earlier in Chapter Two, task interdependence as Sprigg *et al.* (2000) stated is related to the level of technology in the organisations. Shea and Guzzo (1992) stated that task interdependence is related to the interaction among team members and depends on each other to accomplish their tasks. This is also found to be similar to the team player style concept (mentioned earlier in Chapter Three), thus, for practical reasons, it was omitted from the proposed model for team effectiveness in Egypt in the current study. This based on the Egyptian survey in which some organisations declined to give any information that seemed to be related to the way of their work design or even the level of technology they are working with. Besides, in the Egyptian organisations, team members can not choose or change the level of technology in their organisations. The current study would follow the argument that presented above by Kiggundu (1983) and Breaugh (1985) which supported the importance of testing the effect of autonomy separately on team effectiveness. The next part examines the concept of autonomy along with its measures and their psychometric properties.

4.2.1 Team autonomy

Autonomy was defined by Hackman and Oldham (1975, p: 162; in Breaugh, 1985, p: 553) as "the degree to which the job provides substantial freedom, independence, and discretion

to the individual in scheduling the work and in determining the procedures to be used in carrying it out". While Turner and Lawrence (1965; in Breaugh, 1985, p: 553) viewed autonomy as "the amount of discretion the worker is expected to exercise in carrying out assigned work activities".

Breaugh (1985) argued that autonomy as defined by Hackman and Oldham (1975) was found to be confounded with other aspects of job characteristics. He added that autonomy was always found to be measured as one variable, while Kiggundu (1983) argued for the importance of distinguishing the separate facets of autonomy and investigating their effects. Breaugh (1985) argued that distinguishing the separate facets of autonomy would add value. From the literature Breaugh (1985) found that three important autonomy facets were asserted; work method autonomy, work scheduling autonomy and work criteria autonomy. He argued that measuring these three autonomy facets might lead to improved theory development and might aid organisational intervention efforts such as how a job might be modified.

Based on the three autonomy facets, Breaugh (1985, p: 556) defined autonomy as "the degree of control or discretion a worker is able to exercise with respect to work methods, work scheduling, and work criteria". Breaugh's definition of autonomy matched with that of Turner and Lawrence's definition (1965) in terms of work control, however in the autonomy definition by Hackman and Oldham (1975) work independence was related while work criteria was not. Breaugh (1985, p: 556) provided a definition for each of the three autonomy facets. He defined the work method autonomy as "the degrees of discretion/ choice individuals have regarding the procedures (methods) they utilise in going about their work". The work scheduling autonomy was defined as "the extent to which workers feel they can control the scheduling/ sequencing/ timing of their work activities".

The work criteria autonomy definition was "the degree to which workers have the ability to modify or choose the criteria used for evaluating their performance". Breaugh (1985) focused on the employees' perception in order to know how much perceived autonomy they feel they have in their work.

It can be concluded from the team effectiveness literature that there is a positive link between autonomy and performance quality, employees' satisfaction, beneficial work attitude and behaviour (Gardell, 1977; Griffin, 1981; Hackman and Oldham, 1975; Parker and Wall, 1998; Sims, Szilagyi and Keller, 1976 and Sutton and Rousseau, 1977) and there was a negative relationship between autonomy and employees absenteeism and turnover (Breaugh, 1985). Pearson (1992) conducted an exploratory longitudinal study with semi-autonomous work groups in a large Australian company. The comparison between semi-autonomous and non-autonomous work groups in terms of job satisfaction, job motivation, role perceptions, productivity, turnover and absenteeism showed positive changes only in the semi-autonomous work groups. The results indicated that autonomy was positively related to productivity of semi-autonomous work groups. Pinnington and Haslop (1995, p: 5) investigated the effect of autonomy (strategic and operational) on team leaders who were involved in new product development projects in British companies. They stated that strategic autonomy "refers to the freedom to set one's own research agenda", while operational autonomy "refers to the freedom, once a problem has been set, to attack it by means determined by oneself, within given resources constraints". The results showed that autonomy had an impact on team leader's behaviour when the team leaders had been given more strategic autonomy, and there was a positive relationship with a market growth rate.

The findings from other studies demonstrated that autonomy was positively associated with employees' satisfaction for self-directed work teams in both manufacturing and services (Cohen and Ledford, 1994; Cohen, Ledford and Spreitzer, 1996; Cordery, Mueller and Smith, 1991; Pearson, 1992 and Seers, Petty and Cashman, 1995). Autonomy was further found to be positively associated with the attitudinal measures of organisational commitment (Cordery, Mueller and Smith, 1991; Cohen *et al.*, 1996) and trust in management (Cohen *et al.*, 1996). Campion *et al.* (1993) in a study of 80 financial services clerical groups found autonomy to be positively related to productivity. They added that autonomy was presumed to enhance team effectiveness as a result of the sense of responsibility that may increase employees' motivation to perform their work. Yammarino and Dubinsky (1990) found autonomy to be positively related to managers' rating of performance for retail sales groups, but not for insurance groups. Beekun (1989) concluded that the use of autonomous work teams was negatively associated with absenteeism and turnover and positively associated with productivity. Wageman (1997) found that the quality of a team's design (including team composition, team size, the design of the task, the design of the reward system, and many others), more than leader coaching, had a larger effect on the team's level of self-management. Sprigg *et al.* (2000) found that the people who reported themselves to have a higher level of collective autonomy were more satisfied. Hackman and Oldham (1980) and Beekun (1989) stated that high autonomy tended to lead to productive work outcomes. Cohen and Ledford (1994) studied a large sample of self-managing teams at different levels and in varying functions in a service organisation. The results indicated that self-managing teams were more effective than their comparison groups. The work related attitudes such as satisfaction were more favourable among members of self-managing teams.

On the other hand, some studies found different results of autonomy. Kim and Lee (1995) examined the relationship between research and development team climate and team performance in a developing context, in Korea. They found that team autonomy had a negative association with performance. They added that autonomy had a positive impact on the team's performance only when the organisational climate favoured innovation. In a survey of 378 project team members at three research and development facilities in the electronic industry, Levi and Slem (1995) found that self-management was not significantly related to team members' perceptions of their effectiveness. Most respondents reported that their team leader had retained control over most decisions.

Various measures of autonomy may be found in the literature (for example: Hackman and Oldham, 1975; Janz, Colquitt and Noe, 1997; Liden, Wayne and Bradway, 1996; Miller, 1991; Sims *et al.*, 1976 and Wageman, 1995). The most commonly used measures of autonomy are the Job Diagnostic Survey (JDS) by Hackman and Oldham (1975) and the Job Characteristics Inventory (JCI) by Sims *et al.* (1976). Breaugh (1998) claimed that the most commonly used instruments to measure autonomy had been criticised by various researchers, however, researchers continue to utilise them when measuring autonomy. Breaugh (1985, p: 553) argued that the two most common measures of autonomy are based on "a conceptual definition of autonomy which not only includes the concept of discretion but also includes the concept of working interdependently". Breaugh (1985) argued that JDS and JCI as measures of autonomy revealed weak psychometric properties with regard to their construct validity. Dunham (1976) argued that a factor analysis did not support the questionnaire items that were supposed to load on distinct factors, which loaded on one complex factor. Roberts and Glick (1981) argued that there are measurement problems with the JDS scale because of its complex response formats. Aldag, Barr and Brief (1981) reported the internal consistency reliability of JDS and JCI that were found to be marginal

(0.69 and 0.64 respectively), which were below the acceptable minimum level of internal consistency reliability as suggested by Nunnally (1978), which is considered as an acceptable level of internal reliability by Finkelstein (1992), who argued for 0.60 as an acceptable level of internal reliability in social science.

Other researchers also tested the psychometric properties of JDS. The findings indicated a unsatisfactory internal consistency (Fried, 1991), unclear factor structure (Fried and Ferris, 1991), confounding in wording items that related autonomy and independence/ interdependence (Kiggundu, 1983) and measurement problems because of the use of both negatively and positively words items (Idazak and Drasgow, 1987). Breaugh (1998) argued that the same criticism was found in relation to the JCI, the second most commonly used measure of autonomy.

Therefore, Breaugh (1985) developed a Global Work Autonomy Scale (GWAS), which is a new autonomy instrument that distinguished and measured the three facets of autonomy such as work method autonomy, work scheduling autonomy and work criteria autonomy. Breaugh (1985) argued that his new measure of autonomy based on the work of Turner and Lawrence (1965) and Kiggundu (1983). Breaugh (1985, p: 128) argued that the GWAS that he developed "offers an alternative to the most frequently used and much criticised JDS autonomy scale". The psychometric properties of the GWAS was provided by its developer who measured the construct validity of the three work autonomy facets, the internal consistency reliability, the test-retest reliability, the factor structure and the correlation with other autonomy measures that are theoretically associated with. The results indicated an adequate construct validity of the three facets of autonomy measures. High internal consistency reliability coefficients were found among the three facets of autonomy. The factor analysis demonstrated factor stability. Breaugh (1998) examined the reliability and

the validity of the GWAS again in three different studies. The findings from these three studies supported the previous findings of the psychometric properties of his scale. High internal consistency, high test-retest reliability coefficients were found. The results also supported the validity of the scale. Breaugh (1998, p: 127) argued that "more data relevant to the reliability and validity of scores on this measure should be gathered". Breaugh (1985) suggested the need to replicate and extend the scale to add information to its construct validity. Breaugh (1985, p: 555) argued that various researchers had discussed autonomy in terms of work scheduling and work methods while others had been viewed in terms of work criteria too. He argued that "to date no one has empirically examined them". Ashforth and Saks (1995) used the GWAS developed by Breaugh (1985) to create an overall measure of work autonomy by averaging scores on the nine items for measuring three types of autonomy. Breaugh (1998) argued for the need to provide empirical evidence of the reliability and the validity of the average score on the work autonomy measure.

4.3 Group composition design variables

Few empirical studies were undertaken that focused on the relationship between team size and team heterogeneity on team performance. The next part of this chapter examines the available studies related to team size and team heterogeneity and considers the appropriate measures for each variable.

4.3.1 Team size

Hare (1981) stated that group size had been found as a variable of interest among social psychologists. He argued that some questions related to group size that determine the optimal size of the group and the group productivity compared with individual productivity still have the same interest among researchers. The literature review revealed some

relationships between size and satisfaction (Hare, 1981); team performance (Cohen and Bailey, 1997); the quality and quantity of group interaction (Marakham, Dansereau and Autto, 1982) and productivity (Mankin, Cohen and Biskson, 1997). Hare (1976) found that group members are generally less satisfied when the size is increased. Cohen and Bailey (1997) argued that with too few or too many team members the performance would be reduced.

Hare (1981, p: 697) argued that "the group should be just large enough to include individuals with all relevant skills for problem solution". Gallagher, Rose, McCelland, Roynolds and Tombs (1997) found that the optimum group size and its effectiveness is related to the nature of the task. They argued that in some cases large group size is needed to perform the task effectively. Campion *et al.* (1993) agreed with Gallagher *et al.* (1997) and added that when team size becomes too large ineffective teams might be found. Sundstrom *et al.* (1990) argued for the importance of matching the number of team members to the nature of the work. Hare (1981) argued that the optimal size of five members might be appropriate for a small discussion group. Cohen, Ledford and Spretizer (1996) and Mankin, Cohen and Bikson (1997) argued that the small team size is needed to perform the work effectively. In the same direction, Murdock and Scutt (1997) argued that the group behaviour is influenced by the group size. They added that in a large group size (more than twelve members) the group members might lose their cohesiveness and therefore, this might lead them to form subgroups within the group to develop closer working relationship.

Aldag and Brief (1981) found some positive relationships between small group size and cohesiveness with the group members who have similar values, attitudes and share common objectives. Murphy and Heberling (1996) supported the idea of small team size

(normally include six team members) that seemed to achieve the level of skills which is needed to perform the job. They argued that there is a possibility to lose the effective communication among team members in a large team. Mullen and Copper (1994) found that small group size was related positively with cohesiveness. They also found that as group size increased the group performance and the group cohesiveness tended to decrease. Markham, Dansereau and Autto (1982) found that small group size had positive relationships with group cohesiveness and group communication. Amason and Sapienza (1997) found that team size was positively related to conflict among team members. Campion *et al.* (1993) found team size to be positively related to employees' satisfaction, team productivity and team effectiveness. Magjuka and Baldwin (1991) found that larger team size with greater team heterogeneity were positively related to team effectiveness.

On the other hand, the literature concluded some support to the small team size while others prefer to work with large team size that depends on the nature of the task. Hogg (1990) argued that small group size (less than five) might not have the necessary adequate mix of skills and abilities. He also added that with a large group size (more than 10-12) ineffective communication might occur and the group would be divided into subgroups. Min, LaTour and Janes (1995) argued that the larger team size, the better negotiation outcomes will arise. They found that the team size was not significant factor for an effective negotiation.

Bray, Kerr and Atkin (1978) found that the number of non-participants among group members was increased as a result of increasing the group size. Hare (1981) argued that small group (with five members) thought to have enough time to explore their opinions and share their decisions. While with a large group (20 or 30 members) a possibility that only the most powerful members could make the decisions which can lead to dissatisfaction and

less commitment among team members to the group goals. There are four major functional aspects of any group as identified by Hare (1981). He argued that determining the effective group size should be considered in terms of its relation to these aspects. He asserted that for any group to be effective it should have: (i) commitment to the common values; (ii) the necessary skills and resources to achieve their goals; (iii) common rules and roles to co-ordinate and complete their tasks; and (vi) control over their group members to achieve their common goals.

Measuring team size seems to be straightforward by counting the number of team members in each team. Amason and Sapienza (1997) measured the team size by counting how many people were actually involved in the decision. Bantel and Jackson (1989) measured the team size by counting the number of team members in each team. While, Campion *et al.* (1993) included a measurement of the relative team size in their Work Group Characteristics Measure.

4.3.2 Team heterogeneity

Few studies were found examined the effect of team heterogeneity on team performance. Magjuka and Baldwin (1991) found that team members with greater heterogeneity evaluated their effectiveness more positively as a result of more knowledge, better communication and co-operation among team members. Campion *et al.* (1993) argued that heterogeneity might increase the effectiveness because team members can learn from each other. They found no positive relationship between heterogeneity of the team members' background and expertise and team effectiveness in their study. Eisenhardth and Tabrizi (1995) found a positive relationship between heterogeneity and the performance in the new product teams. Cohen and Bailey (1997) argued for the need of more studies on team heterogeneity.

Cohen and Bailey (1997) described the team tenure, the age diversity and the education diversity as other forms of heterogeneity that might have effects on team effectiveness. They argued for an expected positive impact of team tenure on the organisation's performance as a result of the long period of time they spend together that would increase the level of co-ordination among them and could lead them to make effective decisions. However, the empirical studies showed different results of the effect of team tenure on team effectiveness. Eisenhardt and Schoonhoven (1990) supported the positive relationship between team tenure and team performance. While, Amason (1996) and Smith, Smith, Olian, Smis, O'Bannon and Scully (1994) found no effect of team tenure on team effectiveness. Cohen and Bailey (1997, p: 272) in their evaluation of the effect of heterogeneity of age stated that "no studies tried to relate heterogeneity of age to performance outcomes". They also argued that heterogeneity in educational degree might have a positive impact on team performance. Cohen and Bailey (1997) argued that the few studies that had been undertaken focused on the impact of education diversity and team turnover (For example: Jackson *et al.*, 1991; Schneider, 1987 and Wiersema and Bird, 1993). The findings of these studies indicated that in some cases the dissimilarity among team members might lead to discomfort that encourage people to leave the team or leave the job. Bantel and Jackson (1989) found positive association between heterogeneity among top management teams and organisational innovation in banking companies. Jackson, Brett, Sessa, Cooper, Julin and Peyronnin (1991) found a positive relationship between heterogeneity among team members and turnover rate.

Heterogeneity was measured as a part of the Work Group Characteristics Measure by Campion *et al.* (1993) who tested the reliabilities and the factor structure of their scale. High internal consistency reliability was found of the full scale. The factor analysis supported the proposed structure of the full scale. They argued that their scale was reliable

as a set even if there were some scales that had low reliability. It would be thought that heterogeneity with team player styles will go well together in explaining the right mix of team members in a team.

4.4 Organisational context design variables

Team rewards and the team leader behaviour had been found to have a significant effect on team performance and team effectiveness. The next part examines the rewards and its effect on team effectiveness, followed by an examination of the team leader role effect on team effectiveness. Then an evaluation of the measures and the psychometric properties will be examined.

4.4.1 Team reward

The literature revealed a significant effect of the rewards on team motivation and team performance (Lindsay, Manning and Petrick, 1992; Wood, 1990). The rewards were classified according to Lindsay *et al.* (1992) into three main categories. The first is the money pay such as wages, salaries and bonuses. The second is the benefits such as medical benefits, vacations, insurance and any other privileges. The non-monetary rewards such as recognition, praise and working conditions were considered as the third category of rewards. Various studies supported the use of the rewards to increase the level of the employees' motivation that would lead to an increase in their performance. The expectancy theory by Lawler (1986) indicated that there is a reciprocal relationship between the rewards and individuals' motivation, which means that the people perform the tasks and then motivated by the rewards that should be matched with their expectation, which in turn, might increase their motivation to do more efforts. Jeffries (1997) supported the use of the recognition (for example: a note of thanks, praise or a free lunch) as an employees' motivator to achieve better group performance. Kinni (1998) stated that the rewards related

to job satisfaction and performance. He argued that to increase performance the organisations should offer both extrinsic and intrinsic rewards, which include the money as the prime motivator, job security, training, good working conditions and the prestige among peers or groups. Basser (1995) argued for the link between individual motivation, work teams and the rewards. He argued that work teams motivate their members to achieve the organisation's goals. He added that the rewards such as recognition and promotions were seen as motivators for the employees to achieve their goals. Basser (1995) found that the money compensation was the one of the most tangible rewards in Toyota Motor Manufacturing in Kentucky. Verrespej (1998) asserted that there was a gap between the management and the employees in their perception of the rewards. The employees tended to prefer permanent base-pay increases based on their efforts, while on the other hand the management tends to prefer variable-pay systems to deal with each situation. Verrespej (1998) found that the US workers, even if they are working in teams, prefer to be rewarded by an individual pay system.

Team effectiveness found to be affected by the compensation systems. Bartol and Hagmann (1992) found that the existing compensation systems appeared not to support the team concept, which lead the teams to perform ineffectively. They suggested that organisations that working with teams should use team rewards to compensate their teams and team members, which might improve productivity (quality and quantity); increase employees' satisfaction and reduce costs, absence rate and turnover rate. A study by Kearney (1994) reported that when the reward systems do not support the use of teams, teams were found to be failing in achieving their goals. On the same theme, Sisco (1992) found that when individual rewards are used to reward teams, it leads to ineffective team performance. He suggested that any organisation working with teams should reward their teams and team members based on team bonus or gain-sharing plans that encourage the

team behaviour. Armstrong, Curry and Thatcher (1996) supported the team-based pay for work teams to increase their effectiveness. They found that team-based pay was positively related to team performance. They referred to distributing the rewards (money) that related to the team performance among team members as a method of team based pay rewards that had a positive effect on the employees performance. Brown (1995) reported that between 20 to 25 per cent of the UK organisations had replaced the individual pay system with team-based pay system in recent years. The majority of the organisations used gain-sharing and skills-based pay plan to reward their teams. Shaw and Schneier (1995) stated that many companies found it difficult to measure and reward the team performance. Orsburn, Moran, Musselwhite and Zenger (1990) argued for the importance of measuring and rewarding the team performance. Shaw and Schneier (1995) argued that little research had been found focusing on performance measurement and team rewards despite the fact that the use of teams in many organisations had increased. In her study Wageman (1997) showed that neither the individual-based or the mixed-based rewards (in which groups rewards have both individual-based and group-based elements) had any significant effect on team effectiveness.

Cohen and Bailey (1997) stated that the findings from the literature were to some extent mixed. No significant relationship was found between rewards and the managers' rating of performance (Campion *et al.*, 1993; Cohen *et al.*, 1996 and Magjuka and Baldwin, 1991), team ratings of performance (Magjuka and Baldwin, 1991), productivity (Campion *et al.*, 1993) and process effectiveness (Wageman, 1995). While, Cohen *et al.* (1996) found that reward (management recognition) was positively associated with team ratings of performance and satisfaction for both self-directed and traditionally managed groups in a telecommunications firm. They added that when rewards joined with other contextual variables such as information access, training, resources and feedback, a strong positive

predictor of managers' rating of performance for self-directed work groups was found. Wageman (1995) found that the highest performing groups were those whose rewards and tasks had been pure group or pure individual designs. She argued that collective rewards helped in motivating groups, whose tasks were made interdependent. The findings showed the importance of designing rewards that were consistent with the task. Quick (1992) suggested a range of possibilities to give team members rewards based on individual bias, team biases or a mix of both and each organisation should determine the most suitable way to deal with its employees.

4.4.2 Team leader behaviour

The literature asserted the effect of the leader behaviour on team performance (Fowler, 1995; Holpp, 1997; Morehouse, 1997; Thacker, 1997 and Trent, 1996) and on shaping team's norms and behaviour (Ancona, 1990). Different conclusions were drawn in the literature. In self-managed teams, Beekun (1989) found that the performance of self-managing teams that were worked without supervisors were better than the teams with supervisors. Manz and Sims (1987) found that in self-managing teams, the supervisory behaviour was a negative predictor of performance. There is an agreement among authors on the importance of the team leader roles in teams. The studies referred to the team leader role in coaching, directing and managing the external relations (Edmondson, 1999; Hackman, 1990; Isgar, Ranney and Grinnell, 1994; Steckler and Fondas, 1995 and Trent, 1996). Steckler and Fondas (1995) asserted the importance of the role of the team leader in directing the team members in a way that facilitate the team process, and helping the team to develop innovative solutions and making decisions to their problems. They also asserted the importance of the team leader role in coaching and supporting the team members. The team leader role in coaching would encourage the team members to work effectively with each other by sharing information, clarify the others' expectations of the team and identify

and solve any problems that stand in the way of the team performance. They also focused on the external role of the team leader that links the team to other units within the same level of the organisation and with the higher level of management.

Trent (1996) found that the team leader had some effect on a team's effort, team cohesion, goal selections and goal achievement. A study by Isgar, Ranney and Grinnell (1994) noted that the success of teams rests on team leaders. Trent (1996) argued for the importance of the team leader role in managing both internal team process and external relations. Isgar *et al.* (1994) argued for the critical role of the team leader in linking the concept and the implication of quality through team members. Hackman (1987) and Edmondson (1999) argued that team design such as reward, adequate resources along with the team leader behaviour coaching and directing had been shown to increase team effectiveness. Hackman (1990) developed three scales assessing the team leader behaviour in direction setting, coaching and managing external relations.

Edmondson (1999) assessed the psychometric properties of Hackman's team leader behaviour scale (1990). The internal consistency reliabilities for the three scales (directing, coaching and managing the external relations) were high (0.84, 0.80 and 0.84 respectively). The factor analysis for the three team leader behaviour scales were resulted in one single factor (all with factor loading above 0.70) as found by Edmondson (1999). She argued that using one of these three scales was utilised in substantive analysis.

Two other contextual variables such as training and managerial support had some effects on team performance. Campion *et al.* (1993) and Sundstrom *et al.* (1990) asserted that top management must support the use of teams to ensure team effectiveness. Campion *et al.* (1993) argued that little had been found in the literature that examined the relationship

between managerial support and group effectiveness. Campion *et al.* (1993, p: 829) argued that although the managerial support seemed logically to be related to team effectiveness, "there has been little prior research examining its influence". Campion *et al.* (1993) measured the managerial support as a part of the Work Group Characteristics Measure.

4.5 Discussion

It can be concluded that there is extensive research available that focuses on examining the use of team design variables as predictors of team effectiveness. This part combines the findings from team effectiveness models (presented in Chapter Two) with the empirical studies findings examined in this chapter, to develop a model for team effectiveness in Egypt.

Guzzo and Dickson (1996) argued for the importance of three factors to enhance team effectiveness. These factors are design variables (team size and team heterogeneity), team process (team potency) and team context (team leader, team values and culture). Guzzo and Dickson (1996, p: 335) stated that team effectiveness can be enhanced when "changes in team's organisational context are supported by the appropriate team design and process". Ancona (1990) asserted the importance of composition, structure and context that most influence process and performance and highlighted the importance of the external context for team effectiveness.

Cohen and Bailey (1997), Campion *et al.* (1993) and Campion *et al.* (1996) concluded that autonomy was the most powerful predictive variable of team effectiveness. Team autonomy was associated with higher performance for work teams. Campion *et al.* (1993) and Campion *et al.* (1996) argued for the use of design characteristics (team autonomy), composition design characteristics (team heterogeneity and team size), context design

(team managerial support and team rewards) and process (team potency) as predictors of team effectiveness. Campion *et al.* (1996) found little relationship between composition characteristics and group effectiveness. Relative team size seemed to be inconsistent in its relation with team effectiveness. The heterogeneity showed no positive relationships with team effectiveness as a result of the lack of heterogeneity in the sample they used in their study (the majority were female with the same educational level). While, the rewards were related to employees' satisfaction and showed a significant effect on group effectiveness. Managerial support was positively related with effectiveness and it was more predictive of employees' satisfaction. The team members viewed the managerial support as the most critical variable in determining their effectiveness.

Some studies supported the important role of team beliefs (team efficacy, team spirit or team potency) on team effectiveness. Edmondson (1999) asserted that team design variables had an effect on team efficacy. Team potency appeared in team effectiveness models as positive antecedents of effectiveness (Lindsley, Brass and Thomas, 1995 and Shea and Guzzo, 1987). Campion *et al.* (1993, p: 841) stated that potency as one of the process characteristics was the strongest predictor of team effectiveness. They highlighted the "importance of proper group process to the functioning of effective work groups". However, Cohen and Bailey (1997, p: 283) stated that "little empirical field work exists to document this relationship". Guzzo *et al.* (1993) stated that there had been little research on potency. Cohen and Bailey (1997) argued for the need for more research to evaluate that relationship. Campion *et al.* (1996) argued that the process characteristics (for example; team potency) could be as a moderator variable in the relationship between input variables and outcomes in the team effectiveness models. They also argued for the need for future research in this issue.

The results from the literature demonstrated some relationships between the design variables and team player styles and team efficacy or team potency (Edmondson, 1999; Elmuti, 1997 and Uhl-Bien and Graen, 1992). Uhl-Bien and Graen (1992) argued that for teams to work effectively, the team members should act as team players, be committed to the goals, engage in the activity and have common goals in order to be committed to their teams. Elmuti (1997) stated that if the team members can not act as team players, the results could be ineffective teams. Campion *et al.* (1996) argued that a team with permanent team members had more positive team characteristics and were always found to be more effective. They suggested that the single team identity (means that team members involved in one team permanently) played an important role in its effectiveness and argued for the need to examine that in future research.

Team effectiveness was found to be influenced by demographic variables such as team tenure, organisational tenure, age and educational diversity. Cohen and Bailey (1997, p: 274) argued that "outcomes are influenced by demography when there is a direct relationship between the outcome and the demographic variable being assessed". They also argued that no study had been found which focused on the educational heterogeneity and performance.

Cohen and Bailey (1997) based their model of team effectiveness on the need to "select variables to be studied not because they have been traditionally studied, but because they help to understand the effectiveness of different types of teams". On the same theme, Campion *et al.* (1993) argued for the need for future research that combines and tests the five characteristics that they proposed in their study in team effectiveness models and determining which inputs variable enhance team process and team effectiveness. They also argued for the need for more research express the mediation of potency between inputs and

outcomes. Campion *et al.* (1993) found leadership as a potentially important design variable that needs more examination in future research, which plays an important role in determining team effectiveness. Campion *et al.* (1996) argued that effective teams should have jobs with a degree of autonomy and a level of participation in team's decisions working in a supportive context with a positive team process. Campion *et al.* (1993) argued that identifying the design variables were thought to be the first step to design effective teams. Campion *et al.* (1996, p: 449) confirmed that "team design characteristics are practically important as well as statistically significant".

Cohen and Bailey (1997, p: 280) argued for the need to "examine group behaviour and performance at multiple levels". These levels included individual level of analysis, group level of analysis and unit level of analysis. Campion *et al.* (1993) argued that future research might use a group level of analysis. Cohen and Bailey (1997) argued for the use of the perception of performance as an indicator of team effectiveness. Campion *et al.* (1996) found employees' perception of effectiveness were more predictive of effectiveness than the managers' perception of effectiveness. Guzzo and Dickson (1996) argued that most researchers had examined teams in the absence of their context. They argued for the need to study teams in naturalistic settings. Sundstrom *et al.* (1990) argued that most researches on team (specifically on team size) had been undertaken in the laboratory, which might provide unclear findings to be generalised to the work place.

The exploratory survey of some Egyptian organisations (see Chapter One) indicated that the work team type is the most commonly used. Cohen and Bailey (1997) found that task design variables (autonomy and interdependence); group composition variables (size and heterogeneity) and organisational context variables (rewards and supervision) were found to have significant effects as predictor variables to team effectiveness in work team types.

4.6 Summary

This chapter focused on the team design variables and its vital effect on enhancing team effectiveness. Some relationships have been found between team design variables and team player styles and team beliefs that might enhance team effectiveness. The importance of adding the team beliefs in team effectiveness models to mediate the relationship between the inputs and the outcomes had been asserted. Some results also supported the importance of the demographic variables on team effectiveness. Therefore, with the aim of identifying the most significant design variables as predictors of team effectiveness in Egypt, the design variables as suggested by Cohen and Bailey (1997), which found as significant predictors variables of team effectiveness in work team type, will be examined in the proposed model. The next chapter will focus on developing a team effectiveness model for Egyptian organisations.

Chapter Five

Development of Research Model

5.1 Introduction

In the previous chapters the evidence and issues related to team work effectiveness from the literature were reviewed and discussed. This chapter aims to identify the conclusions which may be drawn from this review and identify the areas for further research and a proposed model of team effectiveness. Research hypotheses, research philosophy, research design and potential research limitations are presented and discussed.

5.2 A synthesis of the literature

It can be concluded from previous chapters that the issue of team work effectiveness is extremely broad and the subject of different literatures. Team effectiveness appears to be important for many organisations in their search for the best way to deal with changes in the work environment and to achieve competitive advantage. Several authors have developed and empirically tested their theoretical models related to team effectiveness (e.g., Cohen and Bailey, 1997, Hackman and Morris, 1975 and Sundstorm *et al.*, 1990). All of them focused on either input-process-output or reciprocal frameworks for analysing work team effectiveness. However, there are some differences between authors in the way they present variables as input variables or as process variables. By reviewing and examining these models it seems that there is some degree of consensus in the literature on the importance of certain variables and their impact on team effectiveness. Examples of these variables such as team design variables, team player styles, team beliefs. (Cohen and Bailey, 1997, Guzzo and Dickson, 1996 and Sundstrom *et al.*, 1990).

Campion *et al.* (1996); Cohen and Bailey (1997) and Guzzo and Dickson (1996) argued that design variables had been seen as the strongest predictors of team effectiveness (for example; task design variables, group composition variables and context design variables). Another variable found was team beliefs (for example team potency), which appeared to be a strong predictor of team effectiveness (Guzzo and Dickson, 1996 and Sundstrom *et al.*,

1990). As mentioned in Chapter Two by Shea and Guzzo (1987, p: 26) potency is "the collective belief of group members that the group can be effective". The important effect of team potency in mediating the relationship between input variables and team effectiveness had been found in the literature (Campion *et al.*, 1996). Edmondson (1999) found that team design variables had an effect on team beliefs (team efficacy).

From the team behaviour models developed by Belbin (1981), Margerison and McCann (1985) and Parker (1990) it can be concluded that team roles, which the team members play in their teams, were postulated as essential factors in determining team effectiveness. They also referred to the importance of having a balanced mix of team members to ensure high performance teams. At the same time, in team effectiveness models, attention was also given to team members roles by focusing on the interaction process (Hackman and Morris, 1975); interpersonal process (Sundstrom *et al.*, 1990); internal process (Cohen and Bailey, 1997) as important input variables that ensure team effectiveness and which might be studied with other variables. While, Parker (1990) noted that little research had been conducted to test the effect of team player styles on team effectiveness.

The available literature revealed relatively few empirical studies on teams in organisational settings (Guzzo *et al.*, 1993). It appears from their findings that it is important to develop and explore team work and team effectiveness in detail in real organisational settings. West (1996) and Cohen and Bailey (1997) argued for the need to select and test some variables from their model of team effectiveness to understand the effectiveness of each team type. While Campion *et al.* (1996) argued that team potency mediates in team effectiveness models between the input variables (for example; team design variables) and the outcomes (for example; team performance). The next part examines the further need for empirical research to test certain variables that had been discussed earlier in the literature.

5.3 Research Needed

Many of the major conclusions from the literature have identified the need for empirical research to test the various models already developed. The next part examines the variables that the literature suggests to have important influences upon team effectiveness (as discussed earlier) and the need for more research in the field. The examination of these variables has enabled the development of a proposed model for Egyptian team work effectiveness, which based upon a number of important factors drawn from the literature.

Team player styles: The evidence from the literature indicated the significant effect of the team player styles on team effectiveness (Belbin 1993, Margerison and McCann, 1985, Parker, 1990 and Senior, 1997). However, Senior (1997) referred to the lack of published research on team roles and recommended that more studies are needed to evaluate the theories of team roles. Similarly, Belbin (1993) pointed out that there is a need for further research into team roles and team performance. Funham, Steele and Pendleton (1993) recommended a need for empirical research on team performance and team role theories in the context of real teams in work. Furnham *et al.* (1993) argued that there are few measures that may be used to determine team role behaviour or describe how team members behave in teams. Senior (1997) argued for the need of evaluating other team roles' theories in addition to Belbin's model. Kirnan and Woodruff (1994) examined the Parker Team Player Style Survey and reported data on its psychometric properties, something that Parker did not provide for his scale. They recommended the use of Team Player Style Survey as a useful measure for conducting research in team styles. Sadler-Smith (2001) argued for the need for more studies to explore the Team Player Style Survey's psychometric properties and its factor structure. In its original form the Parker (1990) Team Player Style Survey uses an ipsative scale. Furnham *et al.* (1993) argued that there is a need to avoid many of the problems that associated with the ipsative scales by

developing non-ipsative scales as had been noted by Johnson, Wood and Blinkhorn, 1988; Saville and Willson, 1991 and Anastasi, 1988.

Team autonomy: Cohen and Bailey (1997) and Campion *et al.* (1993 and 1996) referred to autonomy as a powerful predictor of team effectiveness. Breaugh (1985) argued for the importance of measuring the facets of autonomy (work method autonomy, work schedule autonomy and work criteria autonomy). Parker and Wall (1998) found a link between autonomy and performance. Margerison and McCann (1985) stated that high performance work teams have been found to have a high degree of autonomy. However the results from the literature appear to be inconsistent, in some cases the autonomy had a negative effect on team performance for example in Korea (Kim and Lee, 1995). In the same direction Levi and Slem (1995) found no relation between autonomy and team members' perception of their effectiveness. Research is needed to examine the relationship between autonomy and team performance and team effectiveness. Breaugh' s scale of autonomy (1985) was argued to be a new autonomy measure that is an alternative to other widely used autonomy scales (JDS and JCI) that been shown to have weak psychometric properties (see Chapter Four for discussion of properties of JDS and JCI). Breaugh (1985 and 1998) argued for the use of 'The Work Global Autonomy Scale' to measure the three facets of autonomy and he argued that more research is needed to provide empirical evidence of the psychometric properties of his scale.

Team size and team heterogeneity: Guzzo and Dickson (1996) pointed out that size and heterogeneity had shown some relationships with team effectiveness. Sundstrom *et al.* (1990) argued that team composition had seldom been studied in actual work teams despite its importance. Goodman, Ravlin and Argote (1986) found that other issues such as heterogeneity of task abilities might affect the relationship between composition and team effectiveness. Guzzo and Dickson (1996) argued for the need to investigate the

relationships between team size, team heterogeneity and team effectiveness since these appeared to be inconsistent in the literature. Campion *et al.* (1993) developed a 'Work Group Characteristics Measure', which includes a measure of team size and team heterogeneity among other predictors of team effectiveness.

Team leader behaviour: Guzzo and Dickson (1996) concluded that team leaders are a part of the team context that influences team effectiveness. Ancona (1990) argued the importance of the team leader role in managing the internal team process and in handling the external team relations. However, Cohen *et al.* (1996) and Manz and Smis (1987) provided no evidence of the link between team leader behaviour and team performance.

Team management support: James and James (1992) found autonomy and managerial support to be related to overall climate perceptions. Campion *et al.* (1993) referred to managerial support as the most critical variable related to effectiveness (based on team members' perceptions). Campion *et al.* (1993) stated that there was little in the literature that examined the relationship between managerial support and effectiveness. They argued that managerial support could be combined with the team leader behaviour to increase team effectiveness.

Team vision and team psychological safety: Hackman (1990) referred to the importance of clear targets among team members for team effectiveness. Kivamaki and Elovainio (1999) found a relationship between team vision and team performance and found that clear objectives among team members were associated with high performance. In team effectiveness models, mission clarity as an organisational context variable was studied by Sundstrom *et al.* (1990), while Cohen and Bailey (1997) studied the norms in their model of team effectiveness as an input variable that influenced team effectiveness. West (1990) argued for the importance of team vision for the quality of their work. Edmondson (1999)

argued for the importance role of team psychological safety on team performance when team members held similar perceptions. Further research is needed to test the combine effect of team vision and team psychological safety and the team leader behaviour upon team effectiveness.

Team beliefs: Team belief includes team potency (Campion *et al.*, 1993) and team efficacy (Edmondson, 1999) as suggested in the literature. Different authors supported the importance of team belief as a determinant of team effectiveness (Gibson, 1999), others supported the relationship between team belief and high team performance (Bandura, 1982; Sayles, 1989; Shea and Guzzo, 1987). Others supported the cyclic relationship between efficacy and performance (Lindsley, Brass and Thomas, 1995). Also, Campion *et al.* (1993); Edmondson (1999); Gibson (1999); Guzzo and Shea (1992); Bandura (1982); and Guzzo *et al.* (1993) supported the relationship between team belief and team effectiveness. Banadura (1982) called for broad comprehensive research on collective efficacy and the development of measuring group' perception of their efficacy and make a link with group performance. Sundstrom *et al.* (1990) argued for enriched team effectiveness models by adding team belief (team potency). Guzzo *et al.* (1993) and Bar-Tal (1990) stated that little attention had been given in research to potency and they argued for the need to investigate its relationship with group effectiveness in naturalistic settings.

Team performance outcomes: Cohen and Bailey (1997) reported that the majority of studies employed objective measures of team performance (records from the organisation, absenteeism rate, and turnover rate or productivity outcomes), while subjective measures were employed (self-perception of employees and observers' or managers' perceptions) as indicators of team effectiveness (for example: Campion *et al.*, 1996). Cohen and Bailey (1997), Campion *et al.* (1996) and Guzzo and Dickson (1996) argued that half of the studies measured team effectiveness by self-perception of performance as indicators of

team effectiveness. Campion *et al.* (1996) used the perception of employees and the perception of the managers as indicators of team effectiveness. From previous research it can be concluded that team effectiveness was measured in many studies by self-perception of team performance (Cohen and Bailey, 1997; Campion *et al.*, 1996; Guzzo and Dickson, 1996). Other findings from Bandura (1982) found that the higher level of perceived efficacy, the better the performance achieved. He argued for the need to study collective efficacy. He also concluded that self and collective-precepts of efficacy included team performance among its determinants. Sadler-Smith (2001) and Senior (1997) argued that it is important to combine self-report with observer-assessment or with the manager-assessment of effectiveness. Cohen and Bailey (1997) argued for the need to examine group behaviour and performance at individual, group and organisational levels of analysis. Campion *et al.* (1993) and Cohen and Bailey (1997) argued for further research at the group level of analysis.

The next part will examine the proposed model of team effectiveness, which will be tested in the current study, research hypotheses, research philosophy, research design, potential research limitations and summary of the chapter.

5.4 A proposed model of team work effectiveness

The review of the literature and previous research found a few empirical studies of the behaviour of the employees in Arab countries. None of these studies examined teamwork, although some Egyptian organisations have been working with teams. Based on the pilot study in the Egyptian organisations (see Chapter One), it can be concluded that the pilot study suggested that the most commonly used team type in Egyptian organisations is the work team. Cohen and Bailey (1997) concluded that various indicators of team effectiveness are related to the team type. They concluded that team design variables such as autonomy, team size, team heterogeneity, team leader behaviour and team rewards were

the most significant indicators of team effectiveness in the work team type. Hackman (1987) and Edmondson (1999) referred to the importance of team design variables along with the team leader behaviour to increase team effectiveness. Also the literature indicated the significant effect of the team player styles on team effectiveness (Belbin 1993, Margerison and McCann, 1985, Parker, 1990 and Senior, 1997). Guzzo *et al.* (1993), Edmondson (1999) and Campion *et al.* (1993) concluded the important role of team beliefs (team potency or team efficacy) in team effectiveness. Therefore, a model has been developed from the literature in which specific relationships are delineated and summarised in Figure (5.1).

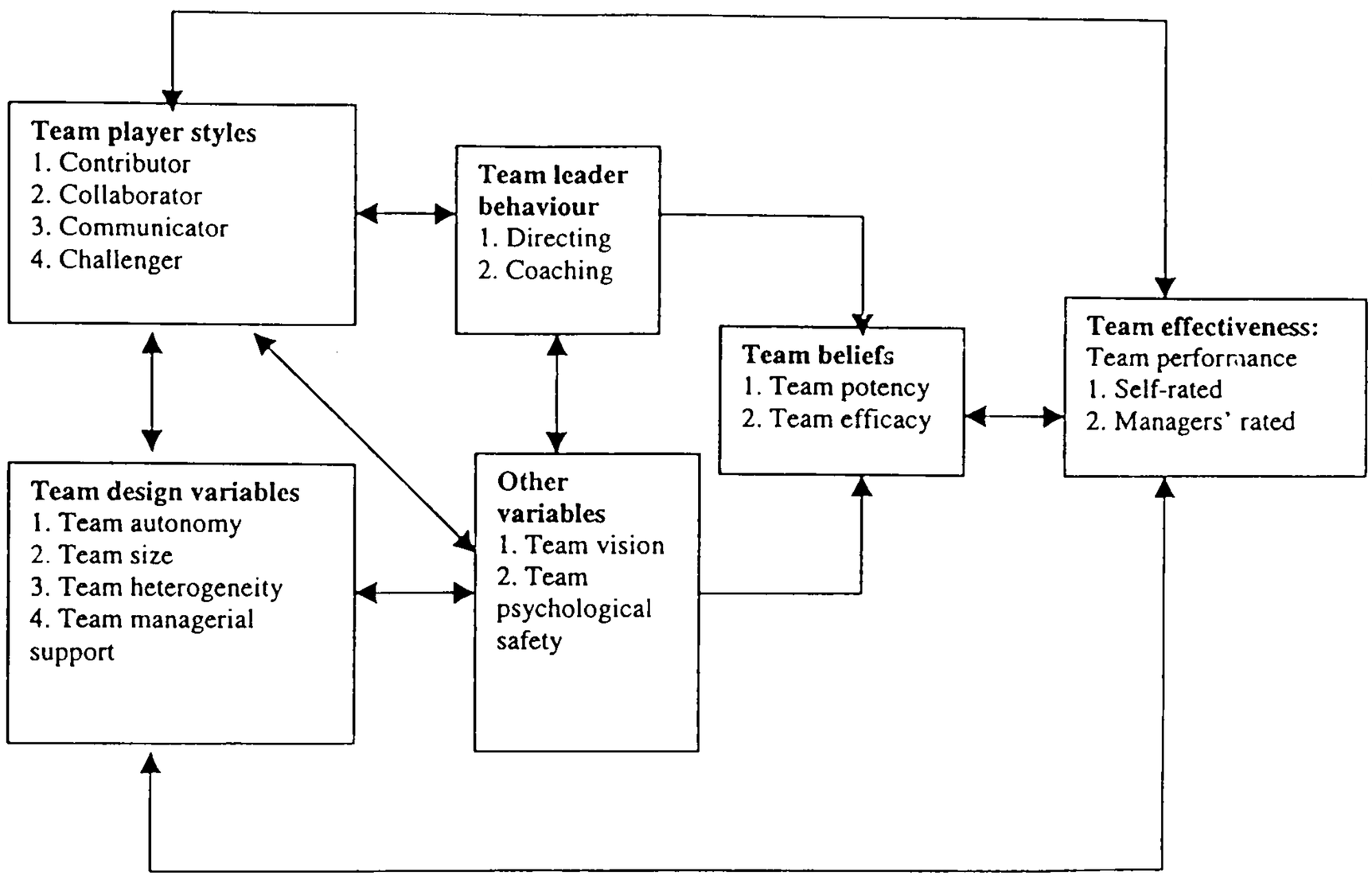

Figure 5.1 The proposed model of team effectiveness to be tested in the current study.

5.5 Research hypotheses

Previous research has revealed the importance of balanced teams to ensure team effectiveness (Parker, 1990, Margerison and McCann, 1985 and Belbin, 1981). They argued that balanced teams are more effective than non-balanced teams. Senior (1997) supported the positive relationship between balanced teams and high performing teams that would lead to effective performance. Therefore, it is hypothesised that:

H1: There are differences between the effectiveness of balanced and non-balanced teams.

Previous research has revealed the importance of team belief as a determinant variable of team effectiveness (Gibson, 1999). The results from previous research supported the relationship between team beliefs and team performance that will lead to team effectiveness (Campion *et al.,* 1993; Edmondson, 1999; Gibson, 1999; Guzzo and Shea, 1992; Lindsley *et al.,* 1995 and Bandura, 1982). Margerison and McCann (1985); Braugh (1985) and Sprigg and Parker (1998) argued that high performing teams will be associated with the high degree of autonomy (as a design variable). West (1990) supported that team vision (as a design variable) influence team effectiveness. Hackman (1990) and Edmondson (1999) supported the relationship between other design variables such as organisational support and team leader behaviour on team effectiveness. Campion *et al.* (1993) supported the relationship between team composition variable (as a design variable) and team effectiveness. Magjuka and Baldwin (1991) supported that team effectiveness was positively associated with team composition variables and the balanced mix of team members. Therefore, it is hypothesised that:

H2: Team beliefs are positively associated with balanced team player styles and team design variables.

Previous research has revealed the cyclic relationship between team beliefs and team performance (Lindsley *et al.,* 1995). Therefore, it is hypothesised that:

H3: Team performance is positively associated with team beliefs.

Based on the previous research explained in the previous hypotheses, it is hypothesised that:

H4: Team performance is positively associated with balanced team player styles, team design variables and a positive team belief.

5.6 Research philosophy

It is unwise to conduct research without considering the issue of research philosophy, which can influence the way research is designed and conducted in practice (Easterby-Smith, Thorpe and Lowe, 1991, 1996). Therefore, the researcher considered the two main traditions of research philosophy; positivism and phenomenology that represent a long-standing debate among the social science philosophers and present a number of fundamental choices in research design. The French philosopher, Comte (1853 in Easterby-Smith *et al.*, 1991, p: 22), was an early and influential proponent of the positivist tradition. The positivist tradition is based on the significance of observations of the external reality (Easterby-Smith *et al.*, 1991, 1996) and is considered by some as the best way of investigating human and social behaviour (Aiken, 1956 in Easterby-Smith *et al.*, 1991, p: 23). Hussey and Hussey (1997, p: 52) argued that positivism is "founded on the belief that the study of human behaviour should be conducted in the same way as studies conducted in the natural sciences". This is based on the assumption that " social reality is independent of us and exists regardless of whether we are aware of it". This means that investigating reality according to the positivism approach has no effect on the reality (Hussey and Hussey, 1997). They added that according to positivists, laws are considered as the basis of explanation, which establishes the causal relationships among the variables being studied and links them to a deductive theory, which would allow the prediction to occur. A number of advantages are suggested from the positivist viewpoint. Positivism provides an independent, objective view of what is being studied, it helps to identify casual explanations and fundamental laws. Moreover, positivism enables quantitative measurement to be undertaken. Furthermore, it provides the possibility by using a

sufficiently large sample size, to make generalisations in human and social behaviour (Easterby-Smith *et al.*, 1991, 1996 and Hussey and Hussey, 1997).

The phenomenological tradition was developed as a result from some observations that major advances in science were produced by independent, creative thinking, rather than through a logical and rational application of scientific method (Easterby-Smith *et al.* 1991, 1996). The phenomenological tradition has gained its importance during the second half of the twentieth century as a reaction to positivism in social science (Husserl, 1946 in Easterby-Smith *et al.,* 1991, p: 24). Hussey and Hussey (1997) argued that phenomenology is based on the assumption that every phenomenon that can be observed is unique and this uniqueness is important. The phenomenology is "concerned with understanding human behaviour from the participants own frame of reference" (Hussey and Hussey, 1997, p: 52). The new paradigm is associated with interpretative sociology (Habermas, 1970), social constructionism (Berger and Luckman, 1966 in Easterby-Smith *et al.,* 1991, p: 24), naturalistic inquiry (Linclon and Guba, 1986) and qualitative research methods (Taylor and Bodgan, 1984 in Easterby-Smith *et al.,* 1991, p: 24). Phenomenology is based on the idea that the truth of events, or the "reality is socially constructed rather than objectively determined" (Easterby-Smith, *et al.*, 1996, p: 24). Unlike positivism, a phenomenological approach may produce multiple realities. Therefore, researchers should try to evaluate the meaning and reasons for people's behaviour by assessing their different experiences rather than searching only for fundamental laws (Easterby-Smith *et al.* 1991, 1996). Phenomenology would help to understand people's mind sets, and give the researcher the ability to look at the change processes over time and to adjust to new ideas as they emerged. It also allows gathering natural not artificial data from people and helps contribute to the evolution of new theories. Morgan and Smircich (1980 in Hussey and Hussey, 1997, p: 51) referred to phenomenology as subjective paradigm in which "reality is seen as a projection of human imagination". One particular approach within the

phenomenological paradigm is hermeneutics. This method attempt to interpret events within their historical and social context. An understanding of the historical context helps to provide clearer picture of how the surrounding issues have developed over time. Social and /or environmental factors are also important for contextual reasons. The emphasis of this research study, however, is more strongly directed at management issues, rather than at wider social factors. There are some difficulties of using phenomenology due to: the great deal of time and the resources needed to collect data, the difficulty of analysis and interpreting of data, and the difficulties of controlling the qualitative research or its progress and even its end-point as suggested by Sarantakos (1993) and Husserl (1950).

Creswell (1994 in Hussey and Hussey, 1997) presented different assumptions of the two main paradigms (positivistic and phenomenological) such as ontological, epistemological rhetorical and axiological assumptions. With the ontological assumption, the researcher needs to decide the nature of reality, which could be objective and external to the researcher (under positivism) or subjective and multiple as seen by participants in a study (under phenomenology). With the epistemological assumption, the researcher needs to determine the relationship of the researcher to what is being studied. While, with the axiological assumption, the concern will be with the values, with the positivistic approach being value free and with the phenomenological approach being value-laden and biased. This means in the phenomenological paradigm, "the researcher will be involved with that which is being researched". While, with the rhetorical assumption the concern will be with the language of research, with the positivistic approach using 'quantitative words', while in the phenomenological approach is the 'qualitative words' (Hussey and Hussey, 1997, p: 49).

Positivism and phenomenology are pure versions of each paradigm; researchers may need to develop methods that provide a middle point to combine both of them in their researches

(Easterby-Smith *et al.* 1991, 1996). It can be concluded that a positivist paradigm is based mainly on objective, independent, and value-free facts by looking for causality and fundamental laws, by reducing phenomena into simple elements to facilitate formulating and testing hypotheses. Therefore, large samples and quantitative data analysis are considered the preferred research methods of positivists. Easterby-Smith *et al.* (1991, 1996) and Watson (1997) argued that many researches in the management field adopt a pragmatic view that combined both traditions. Burrell and Morgan (1979) suggested the importance of breaking down the distinction between the two paradigms by using quantitative and qualitative methods of research design in practice. Moreover, Fielding and Fielding (1986) advocated the use of both qualitative and quantitative methods that facilitate understanding the perspectives on the factors being studied. It was suggested that researchers should attempt to mix methods to some degree (Easterby-Smith *et al.*, 1996, p: 31). Easterby-Smith *et al.* (1996) and Scandura and Williams (2000) suggested that in some cases using different methods might lead to different perspectives of what is being studied. They argued to use triangulation where possible in researches by using both quantitative and qualitative methods together and in order to provide both comprehensive and more reliable data.

5.7 Research design

It had been decided to choose research design in the way that facilitates achieving the research aims. Easterby-Smith *et al.* (1996) suggested five significant choices for choosing the ideal design that also ensure that all the elements of the research design are consistent with each other. These five choices described the degree of researcher involvement, choosing the sample size, focusing on testing theories or generating theories, using experimental design or field work methods and finally vertification or falsification for every research design. In the current study, despite its limitation of not explaining why correlation between things exist, and not eliminating all external factors that may be the

cause of the correlations found, a cross-sectional design was chosen to achieve the research goal by studying large numbers of teams and team members in different organisations. Cross-sectional design is a positivistic methodology that is designed to "obtain information on variables in different context, but at the same time". They added that in cross-sectional design "different organisations or different group of people are selected and the study is conducted to ascertain how factors differ" (Hussey and Hussey, 1997, p: 59). Cross-sectional design is associated with the use of questionnaires and survey techniques (Easterby-Smith *et al.* 1991, 1996). Hussey and Hussey (1997) added that cross-sectional design is usually conducted when there are time or resources constraints and the data is collected once in a short period of time. The weaknesses of cross sectional designs could be overcome if the researcher used a longitudinal research, but it was difficult to choose it because it needs a long period of time to be involved in the organisations which the organisations usually give permission only once. Also the time available for data collection in PhD research is limited. The researcher is aware that looking at only one organisation in depth could limit the generalisability of her conclusions. Therefore, two different organisations were chosen in the current study, which might ensure some degree of confidence of generalisability of the research findings.

5.8 Potential research limitations

There are other variables that effecting team effectiveness, which should also be studied, however for the model not to be over specified, some variables are not included despite their important effects on team performance in the proposed model. This could be considered as a limitation that exists in the proposed model in the current study. The first limitation of the model is the use of PTPS as an ipsative scale, which many authors argued for measurement problems. Also the impact of personality differences on team members' behaviours since these may have an effect on the team players' behaviours. However, the team player styles model (Parker, 1990) used in the research is based on a theory of

personality (Jung, 1923), which could help to understand the teams' behaviour, even if it is not included in the model. Sadler-Smith, Spicer and Tsang (2000) supported the link between cognitive style and personality. Therefore, a supplementary study that aimed to test the psychometric properties of PTPS as a normative scale as modified by the researcher and to test the relationship between TPS and CSI was run by using students' samples in AAST-MT in Egypt with the aim of understanding the Egyptian cognitive style (see Appendix A for details).

Guzzo and Dickson (1996) and Cohen and Bailey (1997) noted that the majority of the psychological research had examined teams in the absence of some considerations such as the culture or the environment in which teams are embedded that are very important for the team effectiveness. Smith and Bond (1993), Smith and Noakes (1996) and Rahmati (2000) argued that there are few studies had been undertaken in previous team literature that examined the cultural effects upon team effectiveness. Hoecklin (1995) and Parnell and Hatem (1999) argued that previous literature revealed only few studies had been undertaken that investigated culture's impacts upon management practices in Middle Eastern countries. Atiyyah (1992) pointed out that in Arab countries, little empirical work had been undertaken in Arab management practices. Yousef (2001) argued the influence of national culture on work values had received little attention in management literature in Arab countries in general, despite its important role in shaping employees' values and beliefs towards work. Nydell (1996) asserted that Arab countries had been subjected to various pressures from the outside world, which affect the way people behave in their work place. For example; the effects of Western technologies and approaches to work, which she argued need the adoption of Western values and social practices as well to complete the work. Therefore, national cultural may be as a contextual factor that might effect team effectiveness. This could be one of the model limitations, because the culture effect is not included in the proposed model (Figure 5.1) for practical reasons.

There is another practical limitation of the model, which is related to collecting data related to the issue of reward in the organisations. Lindsay *et al.* (1992) stated that rewards had a significant relationship with team performance. The team studies indicated the importance of team-based reward on team performance and team effectiveness. Sisco (1992) found ineffective team performance was related to individual rewards. Shaw and Schneier (1995) argued that little research had been found between team rewards and team performance despite its importance in determining team effectiveness. Cohen and Bailey (1997) and Guzzo and Dickson (1996) noted that the majority of research examined teams without looking at team rewards, despite its importance as a predictor of team effectiveness. It seemed difficult to be studied across previous studies for practical reasons. In Egypt, many organisations reject giving any financial information to researchers, however, the researcher tried to investigate the team based-reward system in the Egyptian organisations pilot survey (see Chapter One) to help modify the proposed model.

The team performance measure could be a fourth limitation of the model. There are no objective measures included, which Cohen and Bailey (1997) argued for the need to develop and use subjective and objective measures of team performance. In the organisations' setting it is very difficult to collect any objective measures, which could be a practical limitation of the model. Therefore, a self-rated and a manager-rated of team performance outcomes were employed as an attitudinal indicator of team effectiveness as suggested by Scandura and Williams (2000) the use of data triangulation might lead to better understanding of the variables that being studied.

5.9 Summary

In this chapter the literature revealed in the previous chapters has been synthesised in order to identify factors necessary to team effectiveness in Egypt. Research hypotheses, research philosophy, research design and potential research limitations were discussed and

examined. The next chapters will focus on testing the proposed model in two studies in two different large organisations working with teams in Egypt for many years; Study One (Chapter Six) and Study Two (Chapter Seven). The findings from each study will be used to revise the proposed model of team effectiveness in Egypt and consider the implications for management practice.

Chapter Six: Study One

(Iron and Steel Co.)

6.1 Introduction

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6.3 The research site: Iron and Steel Co.
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6.6 Discussion

6.7 Limitations of the study

6.8 Conclusion

6.9 Summary

6.1 Introduction

As discussed in the previous chapters, there appears to be a lack of empirical work that seeks to evaluate team work effectiveness from both team player styles and team design variables perspectives. This research aims to address this issue through a study of a number of Egyptian companies working with teams in their departments. The site chosen for the first company was a large iron and steel company, which considers itself the pioneer of national producers of rebars, and contributing considerably to the Egyptian national economy. The company is situated in El-Dikheila in Alexandria, Egypt. The study in the first company (Iron and Steel Co.) consisted of a small number of interviews with managers and then a large-scale questionnaire survey as described in the detail of this chapter.

This chapter describes the instrument development including a pilot study. There is also a description of the research site by describing the history of the Iron and Steel Co. in an attempt to set its importance as one of the biggest iron and steel companies in the Middle East. Then a brief description is given of the use of team structures within the company (which will form the basis of the main part of the study as described below in this chapter), data collection, results on individual level and on a group level of analysis and discussion. The final section brings together the findings of both sets of results and summarises the main points made in the chapter and sets the scene for the next study (Chapter Seven).

6.2 Instrument Development

It was decided to use a questionnaire survey in this study. As described before in the previous chapters, the main concern will be testing the impact of team player styles and team design variables on team work performance in Egypt. The above variables were investigated previously in European and North American team environments (For example; Breaugh, 1985; Campion, Medsker and Higgs, 1993; Edmondson, 1998, 1999;

Kirnan and Woodruff, 1994 and Anderson and West, 1994). A description is given of all variables in the suggested model and as used in the questionnaire. As a result of preliminary discussions with managers, it was decided by the researcher to translate the questionnaire into Arabic (the native language of the Egyptian employees) to help their understanding. To achieve that, some translation procedures were followed as described below. The final part of this section describes the way the questionnaire was organised before conducting the pilot study.

6.2.1 Variables description

The proposed model in the current research consists of the variables as described in the previous chapters that are hypothesised as affecting team performance. Table 6.1 describes each variable and its original measure, its author (s), its reliability, number of items and its original response scale.

Variables	Scale title	Author/ s	Test Re-test reliability	Internal consistency reliability (α)	No of items	Response scale
Team player Styles: Contributor Collaborator Communicator Challenger	Parker Team Player Survey PTPS	Parker (1990)	0.76 0.43 - 0.55 0.71 - 0.75 0.51 - 0.53	0.51 - 0.59 0.20 - 0.26 0.65 - 0.55 0.47 - 0.38	18x4	Ipsative scale
Team Design variables: 1-Autonomy a. Method b. Schedule c. Criteria	Global Work Autonomy Scale	Breaugh (1985)	0.67 0.71 0.65	0.92 - 0.91 0.81 0.77 - 0.83	3 3 3	Seven point Likert scale
2- Relative team size	Work Group Characteristics Measure	Campion, Medsker and Higgs (1993)	N/A	---	1	Five point Likert scale
Team performance	Team performance	Hackman (1990)	N/A	0.76	5	Seven point Likert scale
Team vision	Team Climate Inventory	Kivimaki *et al.* (1997)	N/A	0.84 to 0.86	4	Five point Likert scale
Team heterogeneity	Work Group Characteristics Measure	Campion, Medsker and Higgs (1993)	N/A	0.74	3	Five point Likert scale
Team belief (team efficacy)	Team efficacy	Edmondson (1998)	N/A	0.63	3	Seven point Likert scale
Team belief (team potency or spirit)	Work Group Characteristics Measure	Campion, Medsker and Higgs (1993)	N/A	0.80	3	Five point Likert scale
Team managerial support	Work Group Characteristics Measure	Campion, Medsker and Higgs (1993)	N/A	0.74	2	Five point Likert scale
Team leader behaviour: 1.Team leader coaching 2.Team leader directing setting	Team leader behaviour	Hackman (1990) Hackman (1990)	N/A N/A	0.80 0.84	3 3	Five point Likert scale Five point Likert scale
Team psychological safety	Team psychological safety	Edmondson (1998)	N/A	0.82	7	Seven point Likert scale

Table 6.1 Variables description. N/A means not available

6.2.2 Instrument Permissions

Permissions were needed to use some of the above scales for this study. Thus, where appropriate the researcher contacted the original authors of the scales first via e-mails and ordinary mail to explain the aims of her research and need to use the scales in the current research . Permissions were granted wherever sought.

A permission to use the Team Player Style Survey was sought from Consultanting Psychologist Press (CPP) who are the authorised publishers of the scale. After explaining the reason for using only part of the scale (just 10 statements that are appropriate for the Egyptian culture-see below) permission was granted. A permission was also granted to translate that part into the Arabic language for research use only. The final permission and agreement with some limitations is enclosed in Appendix B. The CPP required a permission fee of $595 (payable by the researcher).

6.2.3 Translation Procedures

Appropriate steps were taken to translate the questionnaire into Arabic. First the researcher translated the questionnaire and it was reviewed by an Egyptian colleague, who was studying at Plymouth Business School. Some changes were made as a result of comments made. Brislin (1970, 1976) and Hui and Triandis (1985) and Newmark (1988) suggested a back-translation test as a useful technique that ensures a degree of accuracy of the translated statements. The back translation was made by a professional translator from Arabic to English and was cross-examined by another English native language professional, who made a comparison between the original questionnaire and the back translated questionnaire (both in English). Any major differences were noted and corrected to ensure semantic matches between the two versions. This is similar to the procedures that followed to translate the Anderson and West's TCI from English to the Finnish version, see Kivimaki, Kuk, Elovainio, Thomson, Kalliomaki-Levanto and Heikkila (1997).

6.2.4 Design of Research Instrument

For consistency and to make the questionnaire straightforward and relatively quick to compete, all statements were presented in the same format (Easterby-Smith, Thorpe and Lowe, 1996). It had been decided to set the Arabic questionnaire version into four main categories, team player styles, team performance, other variables and some biographical information accordingly.

6.2.4.1 Team Player Styles

In its original form the team player styles questionnaire consists of 18 statements, each of which has four possible endings. The respondent is asked to rank the endings in the order in which he or she feels each one applies to her or him by placing number four next to the ending which is most applicable and continuing down to placing a one next to the ending which is least applicable to them. Hence, every respondent has to rank each ending for every statement (a forced-choice or an ipsative scale). Moreover, there are some drawbacks of such tests as suggested by Johnson, Wood and Blinkhorn (1988, p: 154 in Furnham *et al.*, 1993, p: 247) as follows:

> "(i) They can't be used for comparing individuals on a scale-by-scale basis; (ii) correlations amongst ipsative scales cannot legitimately be factor analysed in the usual way; (iii) reliabilities of ipsative tests overestimate, sometimes severely, the actual reliability of the scales: in fact, the whole idea of error is problematical; (v) for the same reason, and others, validities of ipsative tests overestimate their utility; (vi) means, standard deviations and correlations derived from ipsative tests scales are not independent and cannot be interpreted and further utilised in the usual way".

Moreover, Anastasi (1988, p: 553) noted:

> "in conclusion, it appears that the forced-choice technique has not proved as effective as had been anticipated in controlling faking or social desirability response sets. At the same time, the forced-choice item format, particularly when it yields ipsative scores, introduces other technical difficulties and eliminates information about absolute strength of individual characteristics that may be of prime importance in some testing situations".

For the above reasons, it was decided to make some modifications to the PTPS in order to improve its effectiveness. First, the statements were scaled on a five point Likert scale ranging from strongly agree (5) to strongly disagree (1). For each statement, there were four sub-sentences (which respondents were required to rank order in the original questionnaire). Every respondent has to express his feelings towards the all statements according to the Likert scale that was used. The modified version of team player survey had ended up with ten statements with a total of 40 items. The modified version was approved by CPP. The current measure therefore is not forced choice and hence unlike the original measure (see Appendix C for items).

Second, ten statements were chosen to be included in the Arabic version questionnaire as a result of a pilot study on twenty people working at Arab Academy for Science and Technology and Maritime Transport AAST-MT in Egypt. This is similar to Breaugh (1985) who used 20 participants to pre-test his scale before carrying out the main study. The ten statements appeared to be both relevant and appropriate to the Egyptian context and culture. In the Egyptian context people may be biased to themselves, and are likely to always agree on the positive items of any questionnaire, especially if it is describing themselves. Also, there are some words even after translated into Arabic are difficult to understand. This was the reason used not to include this type of item in the Arabic version of the team player styles survey. Eight statements were excluded, that asked the respondents to evaluate their behaviour for example items: (3) "Under stress, I sometimes...," (5) "Other team members usually see me as...;" (6) "At times, I'm..., "(9) "Sometimes other team members see me as...," (12) "At times, I make other people feel....;"(15) "Sometimes I..., (16) People have often described me as...," and (17) "Most of the time, I'm...". It can be noticed the change in the scale items from 18 statements with four possible endings (with a total of 72 items) to become 40 items in a normative scale (see Appendix A for details).

6.2.4.2 Team effectiveness

In the current study a self-report and manager-report measures of team performance were used as indicators of team effectiveness. As in the original measure developed by Hackman (1990), Edmondson (1998; 1999) used five statements to measure team performance in her study. The original response scale was a seven point Likert scale, ranging from strongly disagree (1) to strongly agree (7). The same measure was used in the current study but with a change in the measuring scale. A five point Likert response scale was used from strongly disagree (1) to strongly agree (5), this to make all the scales the same to ensure consistency and avoid confusion (see Appendix C for items). As well as a self-report assessment of team performance, each team was rated by its managers on a manager version of the performance scale. This was considered as a manager-report assessment of team performance as an indicator of team effectiveness. The same measure was used by Edmondson (1998; 1999) to measure team performance from the manager's point of view. A five point Likert response scale was used from strongly agree (5) to strongly disagree (1) (see Appendix C for items). The manager-report assessment used in this study was at the group level of analysis (as explained in detail later in this chapter, see Appendix D for the English questionnaire for managers' evaluations).

6.2.4.3 Variables Affecting Team Work

Team autonomy

Autonomy facets used in the current study were work method autonomy, work schedule autonomy and work criteria autonomy (Breaugh, 1985). In the original measure of autonomy Breaugh had used three different items for every facet, giving a total of nine items. Items were responded to a seven-point continuum from strongly disagree (1) to strongly agree (7). A five point Likert scale from strongly disagree (1) to strongly agree (5) was used in order to present the all statements in the same format (see Appendix C for items).

Relative team size

To measure the relative size of teams in the Egyptian context, only one item was chosen from the Work Group Characteristics Measure, which consists of fifty-four items and developed by Campion, Medsker and Higgs (1993). A five point response format was used ranging from strongly agree (5) to strongly disagree (1). The same measure was used in the current study without any modification (see Appendix C for the item).

Team vision (TCI)

A short version of Team Climate Inventory TCI (Anderson and West, 1994) was tested by Kivimaki, Kuk, Elovainio, Thomson, Kalliomaki-Levanto and Heikkila (1997) and provided evidence of similar psychometric properties as for the original version. In the current study, the team vision scale from the short version of vision from TCI was chosen for the reasons outlined in the proceeding chapters. Four statements were used with a five point response format ranging from strongly agree (5) to strongly disagree (1). See Appendix C for items.

Team heterogeneity

From the Work Group Characteristics Measure (Campion, Medsker and Higgs, 1993) three statements were used to measure the team heterogeneity with a five point response format ranging from strongly agree (5) to strongly disagree (1). The same measure was used in the current study without any modification. See Appendix C for items.

Team beliefs: team potency (spirit) and team efficacy

Team belief was measured by two different measures in the current study. First, three statements were used from Work Group Characteristics Measure (Campion, Medsker and Higgs, 1993) to evaluate self-rated team belief (team potency or spirit). A five point response format was used ranging from strongly agree (5) to strongly disagree (1). The same measure was used without any modification (see Appendix C for items). The second

measure that was used to measure team beliefs (team efficacy) was as suggested by Edmondson (1999). In her study a self-report assessment of team efficacy using three statements to measure team beliefs. The originally response scale was a seven point Likert scale, ranging from very inaccurate (1) to very accurate (7). In the current study, the same measure was used but with a change in the measuring scale. A five Likert response scale was used from very inaccurate (1) to very accurate (5), this to make all the scales the same to ensure consistency and avoid confusion (see Appendix C for items). The same measure was used as suggested by Edmondson (1999) to measure the managers' rating of team beliefs (team efficacy). A five point Likert scale was used from strongly agree (5) to strongly disagree (1) (see Appendix C for items). The managers' report assessment was used in the current study at the group level of analysis (see details in this chapter).

Team managerial support

Another two statements were also drawn from the Work Group Characteristics Measure (Campion, Medsker and Higgs, 1993) to evaluate the degree of managerial support in teams. A five point response format was used ranging from strongly agree (5) to strongly disagree (1). The same measure was used in the current study without modifications. See Appendix C for items.

Team leader behaviour

In the current study two scales were used to assess team leader behaviour (team leader direction setting and team leader coaching) as developed by Hackman (1990). Each scale consists of three different items, using a five-point response format ranging from never (1) to frequently (5). The same scales were used in the current study without modification. See Appendix C for items.

Team psychological safety

Edmondson (1998; 1999) developed a scale to measure team psychological safety using new items designed to address several features of this construct. She used seven items on a seven point Likert scale ranging from very accurate (7) to very inaccurate (1). The same scale was used in the current study with a change of the response scale. A five point Likert scale ranging from very accurate (5) to very inaccurate (1) was used. See Appendix C for items.

6.2.4.4 Biographical Information

The current questionnaire also asked participants to provide personal information on age, gender (male or female) and education level (high school, college degree and post-graduate degree). Other information related to current position, job tenure (number of years in current position) and team tenure (number of years each person had worked in a team) was also asked for. Tick boxes were provided only for gender and education level. See Appendix C for items.

6.2.5 Pilot Study

It was considered a necessary to conduct a pilot study first to test the research instrument before carrying out the main questionnaire study (Breaugh, 1985). One of the main reasons for conducting a pilot study questionnaire is to identify and hence avoid any misunderstanding or ambiguities in the questionnaire statements. Changes in questionnaire wording or its administration may be suggested to guarantee clear understanding from the respondents. The pilot study targeted twenty randomly selected team members working in a department at AAST-MT in Alexandria, Egypt. A serial number was written on the right corner of every questionnaire by hand before distributing them. This procedure aims to facilitate counting of the questionnaires issued to from the target department. The questionnaires were distributed by hand to each team member in the pilot study. The

researcher also works at AAST-MT, so it was easy to distribute the questionnaires by hand and take the replies. A small number of modifications were suggested. There were some suggestions to change some Arabic words related to the construction of the statements of items number five, eight, and ten in the PTPS. The first sentence in team performance was changed also.

Therefore, as a result of the pilot study a number of modifications were made to the questionnaire. In the pilot questionnaire, variables of autonomy, relative team size, team vision, team heterogeneity, team managerial support, team leader behaviour and team psychological safety were arranged in one category. It was suggested to add more space to separate every variable from the others. Small tables were designed to contain each variable in order to make it easier to understand. The modified questionnaire consisted of 83 items and it was evaluated by asking another five team members to complete it. The questionnaires were completed without any problems being encountered. A final version of the Arabic questionnaire is shown in Appendix D.

6.3 The Research Site: Iron and Steel Co.

6.3.1 History of Iron and Steel Co.

The research site, which will be referred to as Iron and Steel Co. was founded in 1982 as a joint stock company. This was under the Law 43 for 1974 replaced by Law 230 for 1989 which was replaced by investment guarantees and incentives Law number 8 of 1997 to produce reinforcing bars and rods promoting the stable supply for domestic demands and import substitutes. The company was designed to be an integrated plant (at El-Dikheila) comprised of three major process plants, namely direct reduction plant, steel making plant and rolling mill plant with auxiliary facilities. The company started production in May 1986, reached the designed capacity (745 thousand tonnes / year) in the mid of 1988 and since that date the plants maintained a steady production increases surpassing its designed

capacity until it reached 1,234,150 tonnes in 1995. The years 1996 and 1997 witnessed the expansion of the project, which included the shut-down of some production units for certain periods. In spite of such shutdown, the production figures achieved in 1996 and 1997 were 1,118,945 and 1,244,164 tonnes respectively. This surpassed the production targets planned for these two years, and by completing the expansion units and accomplishing the plant's development, the start-up was successfully achieved on regular basis. Guarantee Test Certificates was issued for all the production units during the quarter of 1998. Also, the second bar mill plant started production on September 1998 realising 67,000 tonnes by the end of the year. Hence the total production of the original project, the expansion and the second bar mill reached 1,516,000 tonnes in 1998. With respect to, the flat steel project designed to produce one million tonnes per annum of flat steel to participate in covering the local demand of this type of production and exporting the surplus to the international markets. This implementation is going on according to schedule and planned to start production in January 2000.

Only men can be employed in Iron and Steel Co. according to the organisation's philosophy. The employees were drawn mainly from Egypt and some of them from Japan. Human resources are considered by Iron and Steel Co. as their most important resource of the organisation, for example much attention is given for to human resources through implementing and developing: (i) career planning; (ii) industry safety; (iii) training programs. Also the company is focused on the employees' health care and improving their working conditions.

The company gives attention to analysing the turnover rate of the employees to ensure stability and effectiveness of their human resources system. The company believes also in working in teams since this will increase the co-operation, promote team work spirit and exchange assist in the experiences and knowledge. Improvements in quality and reduced

costs were found as a result of the introduction of the team work approach in the company. The size of the workforce at Iron and Steel Co. is 2791 employees producing 1516 thousand tonnes, achieving 1544 million Egyptian pound from sales with 71 million Egyptian pound net profit in the year 1998 (see company's Annual Report, 1998-1999). The company gives high attention to training its employees with the new training methods to increase their productivity. As a result, trainees' numbers reached 1716 trainees attending 144 different courses (some of them concerning with the teamwork approach). The average training days reached 4.4 men/day per year in 1998-1999. The company is analysing the employees' turnover as an important indicator to judge the stability and the effectiveness of the company. As a result of the company's efforts in improving the work conditions, the turnover rate reduced from 3.8% in 1991 to 1.6% in 1999.

The Iron and Steel Co. was chosen for this study not only because it is a pioneer in the field of teamworking but also because it is considered one of the most important companies for the Egyptian economy. Also, Iron and Steel Co. has a strong belief of the importance of teamwork in all activities.

6.3.2 Teamwork at Iron and Steel Co.

The work at Iron and Steel Co. is divided mainly among four main categories of departments. The first is responsible for the administrative work (general affairs, public relations, recruitment, purchasing, computer, safety, training, and sales). The second is responsible for the financial issues at the company (growth, cost, budget, auditing and accountant). The third is responsible for the production (production and production control) and the fourth is responsible for the construction, maintenance and utility. Iron and Steel Co. implemented teamwork concept at all departments. The work is divided among the employees, who are working in teams in each department. Team members at Iron and Steel Co. ranged from two to 20 depending on the kind of tasks they have to

perform. Different kinds of teams were found at Iron and Steel Co. such as functional teams, work teams, project teams and advice teams. The Iron and Steel Co. has: (i) functional teams, which consists of managers and supervisors like sales teams, management teams, purchasing teams, ...etc; (ii) work teams (production teams), which consists of peers working together to perform day-to-day operations. For example: manufacturing teams, and maintenance teams; (iii) project teams to find creative solutions to the company problems like planning teams, growth teams and computer teams; (iv) advice teams, which consists of people who facilitate suggestions for quality improvement from volunteer production and service works such as quality circles teams.

An interview was conducted with a general manager of Iron and Steel Co. to get permission to distribute the questionnaires into the company, after explaining the aim of the study. The general manager pointed out that the work in his company is mainly based on teamwork in every department, but he suggested distributing the questionnaires into general administration department and financial department only. He suggested these two departments because the majority of team members in these departments may be found easily in their offices in the main business building. He also recommended that from the company past experience dealing with researchers, it is very difficult to find the suitable time to deal with the team members in the factories, such as production teams, maintenance teams and quality circles teams. The researcher suggested meeting these team members in their lunch hour, but the manager refused. Other interviews were made with the head of each department that the general manager recommended. The aim of these interviews was to find out about the number of teams, and team members in each department. After these interviews, the chosen sample taking part of this study was composed of 132 team members working in two different departments, general administration department and finance department. General administration department

divided the work among fourteen teams and the finance department divided the work among five teams. Table 6.2 describes the teams in each department.

Department	Teams	Number of members
General Administration	1.Work Affairs	7
	2.Public Relations	4
	3.Recruitment	6
	4.Purchasing	18
	5.Local Purchase	2
	6.Foreign Purchase	5
	7. Raw Material Purchase	3
	8. Control Inventory Purchase	3
	9. Computer	9
	10. Safety	4
	11. Co-ordination	3
	12. Training	2
	13. Sales	20
	14. Machine & Supply Purchase	17
Finance	1. Growth	4
	2. Cost	4
	3. Budget	6
	4. Auditing	5
	5. Accountant	10
Totals	**19 teams**	**132**

Table 6.2 Teams in the sample.

6.4 Data Collection

6.4.1 Distribution and collection of the questionnaires

After conducting the pilot study, it was decided to distribute the modified questionnaires to the chosen sample. The questionnaires were distributed to all team members in their work site by hand via a manager at Iron and Steel Company. The researcher was not allowed to distribute the questionnaires by the managers of the chosen departments. The questionnaires were distributed during September 1999. No time limit was specified for completion of the questionnaires. It was arranged that respondents should return the questionnaires back to the manager who distributed them, and then the researcher in person collected all completed questionnaires. It was thought that this method of administration would ensure high response rate from the team members.

The distributed questionnaires were 250 (the number of team members in the chosen departments), 132 completed questionnaires were returned with a response rate 52.8 per cent. A serial number was written on the right corner of every questionnaire by hand before distributing them. The serial number that used was consisted of three numbers to indicate the number of respondent / number of department / number of team. It was decided to use number one for general administration department, and number two for the finance department. And the numbers that given to each team are shown in Appendix E.

For example: (2/1/15) meant the second team member in general administration department in the cost team. Using the serial number that would facilitate easy grouping of the completed questionnaires together.

6.4.2 Coding and analysis of the questionnaires

Responses were coded and entered into SPSS (the Statistical Package for Social Sciences Version 9.0). Using appropriate coding, for example number one to five Likert scale answers according to each scale: (5 for strongly agree through to 1 for strongly disagree), (5 for very accurate, through to 1 for every inaccurate), and (5 for frequently through to 1 for never). On the data sheet 90 variables were created, 83 from the questionnaires and extra seven variables were then added from the biographical information (age, gender, education level, current position, job tenure and team tenure). Individual items from biographical information were coded in the same way by using number one for male, number two for female. Education level was coded by using number one for high school, two for graduate degree and number three for post-graduate degree. Current position was coded by using number one for manager and two for supervisor. While variables like age, job tenure and team tenure were coded as given in the questionnaires.

The second step was to re-code the variables that were reverse scored (as mentioned in the original scales) prior to any statistical analysis. The analysis was made in two stages: the first was at the individual level; the second was at the group level (explained later in this chapter in detail).

6.5 Results

The results will be considered in three sections: (i) characteristics of sample; (ii) individual level of analysis; and (iii) group level of analysis.

6.5.1 Sample characteristics

Table 6.3 shows the characteristics of the sample in terms of gender, education level, current job and department. Table 6.4 shows the mean, standard deviation, range by years in terms of years in job, experience and team experience.

Category	Frequency	Per Cent
Gender:		
Male	132	100
Female	0	0
Education:		
High School degree	4	3.0
College degree	110	83.4
Post graduate degree	18	13.6
Current Job:		
Managers	48	36.4
Supervisors	84	63.6
Department:		
Finance	29	22
Business Administration	103	78

Table 6.3: Sample Characteristics

Category	Mean	SD	Range (years)
Years in Job	9.74	6.01	From 0.25 to 27 years
Experience (years)	7.37	4.57	Up to 25 years
Team experience (years)	3.73	5.33	Up to 27 years

Table 6.4: Sample characteristics (Years in experience)

It may be seen from the tables that all team members in the sample were men and the majority had a college degree. There were also a variety of experiences amongst the team members. Some team members had no experience in working with teams while others had 27 years of experience. This indicated a sample encompassing differences in the company's departments, and teams in each department, size, tenure, and age and education level.

6.5.2 Individual level of Analysis

The analysis at the individual level with all team members in the chosen sample was conducted as follows:

6.5.2.1 Descriptive Statistics and Scale Reliability

Descriptive statistics

The descriptive statistics (means and standard deviations) for the scale were computed and are shown in Table 6.5. It should be noted that in every case the scale means are above the scale mid-point (3.00). This may indicate a response bias (for example, social desirability-see conclusion for further discussion).

Scale	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Team player Style:																			
1.Contributor	4.24	0.32	**39**	53**	60**	67**	14	10	15	24**	28**	09	16	16	30**	19*	14	09	-01
2.Collaborator	4.12	0.35		**39**	54**	59**	02	16	37**	32**	46**	00	20*	14	21*	30**	13	- 04	-02
3.Communicator	4.13	0.39			**52**	64**	13	19*	10	13	33**	12	35**	35**	38**	34**	18*	16	02
4.Challenger	4.17	0.35				**52**	17*	10	19*	17*	31**	03	22*	23**	35**	29**	18*	11	-11
5. Team Performance	3.87	0.55					**61**	18*	- 10	19*	- 02	33***	23**	41***	30**	27**	39***	35***	-06
6. Team Belief (team efficacy)	3.76	0.78						**49**	35**	21*	15	20*	15	27**	21*	28**	29**	30**	-07
7. Work Method Autonomy	3.99	0.82							**80**	41**	41**	- 04	01	12	06	12	14	05	-16
8. Work Schedule Autonomy	3.99	0.65								**45**	37**	02	15	10	12	23**	14	- 06	-03
9. Work Criteria Autonomy	3.69	0.84									**71**	00	17	16	14	13	- 02	- 11	-02
10. Team Vision	4.07	0.64										**85**	33**	41**	26**	25**	23**	30**	05
11. Team Heterogeneity	3.83	0.68											**48**	38**	22*	29**	15	12	-04
12. Team Belief (team potency)	4.25	0.67												**77**	54**	35**	48**	25**	-06
13. Team Managerial Support	4.23	0.79													**60**	44**	42**	24**	05
14.Team Leader Directing	4.13	0.69														**76**	56**	30**	10
15.Team Leader Coaching	4.25	0.67															**70**	34**	02
16. Team Psychological Safety	3.52	0.55																**56**	-07
17. Relative Team Size	2.80	1.18																	-----

Table 6.5: Descriptive statistics, inter-correlations and scale reliabilities at individual level of analysis (Cronbach α shown along the diagonal in bold). Zeros and decimal points omitted from correlations and reliabilities. *Note:* $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Scale Reliability

Nunnally (1978), Ghiselli, Camplell and Zedeck (1981 in DeVellis, 1991,p: 24) and Rust and Golombok (1999) all consider the reliability of a scale to be a fundamental issue in psychological measurement. According to Nunnally, there are some factors should be considered regarding the reliability of each scale:

(a) internal consistency may be assessed by estimating the average correlation among the items in the scale and any other set of items measuring the same variable (Nunnally, 1978). This is called coefficient α or Cronbach's α and it provides a good estimate of the reliability in most situations (Kline, 1976, 1998) and is widely considered the most effective and important way of measuring the reliability of a scale (Bryman and Cramer, 1999). Kline (1976, 1998) and DeVellis (1991) pointed out that the internal consistency (Cronbach alpha or coefficient α) is widely used as a measure of reliability of the scale. The internal consistency reliability is concerned with the homogeneity of items that make up a scale. High inter-item correlation means that the items are measuring the same construct (DeVellis, 1991). Cronbach (1951) and Kline (1993) argued that an α of 0.70 is regarded as an acceptable level for an adequate test, Finkelstien (1992, p: 519) argued that "in practice an alpha greater than 0.60 is considered reasonable in organisational research (Eisenhardt, 1988; Van De Ven and Ferry, 1980)". Teo and King (1996, p: 314) argued that "the reliability coefficients are equal to or above the recommended value of 0.60 for exploratory research".

(b) alternative forms may be assessed by calculating the Pearson Product Moment correlation coefficient (PPM) between the scores of the respondents for two different version of the test, which are linked in a systematic manner, (called parallel tests) (Nunnally, 1978 ; Rust, Golombok, 1999),

(c) other estimates of reliability include test-retest reliability, split-half reliability (Nunnally,1978; Rust, Golombok, 1999 and Bryman and Cramer, 1999) and inter-rater reliability (Rust, Golombok,1999 and Bryman and Cramer, 1999).

In the current study, internal consistency was chosen according to the following reasons:

(a) there is a need to test the extent of the homogeneity of the items in the scales used;

(b) it was difficult to convince the respondents to answer the questionnaires twice with time interval to assess the test-retest reliability of the scale. This needed permission from the higher management level in the chosen company and unfortunately the company gave the researcher permission to distribute the questionnaires once only.

In order to establish the internal reliability of the scale Cronbach α were calculated. Table 6.6 shows Cronbach α for each of the scales in the previous studies compared with the calculated Cronbach α in the current study.

Scale	In previous studies	In current study
Team player styles: Contributor Collaborator Communicator Challenger	 0.51 (Students), 0.59 (Business) 0.20 (Students), 0.26 (Business) 0.65 (Students), 0.55 (Business) 0.47 (Students), 0.38 (Business) (Kirnan& Woodruff, 1994)	 0.39 0.39 0.52 0.52
Autonomy: Work method autonomy Work schedule autonomy Work criteria autonomy	 0.92 - 0.91 0.81 0.77 - 0.83 (Breaugh, 1985)	 0.80 0.45 0.71
Team performance	0.76 (Hackman, 1990)	0.61
Team vision	0.84 to 0.86 (Kivimaki *et al.* ,1997)	0.85
Team heterogeneity	0.74 (Campion, Medsker & Higgs, 1993)	0.48
Team belief: Team efficacy	0.63 (Edmondson, 1998)	0.49
Team belief: team potency or spirit	0.80 (Campion, Medsker & Higgs, 1993)	0.77
Team managerial support	0.74 (Campion, Medsker & Higgs, 1993)	0.60
Team leader behaviour: Directing Coaching	 0.84 0.80 (Hackman 1990)	 0.76 0.70
Team psychological safety	0.82 (Edmondson, 1998)	0.56

Table 6.6 Cronbach α for each of the scales in the previous studies and calculated Cronbach α in the current study.

Table 6.6 presents Cronbach α for the scales. The Cronbach α for team player styles from previous research (Kirnan and Woodruff, 1994) ranged from 0.20 to 0.65 in students' sample and from 0.26 to 0.59 in the business sample with no statistically significant differences between the two samples. This indicated low internal consistency for Team Player Styles scales, particularly for collaborator and challenger scales. Kirnan and Woodruff (1994) suggested that the lower estimated Cronbach α of Parker Team Player

Styles Survey PTPS may be derived from the small number of items per style, and the tendency of individuals to report more than one style. The Cronbach α for the autonomy scale from previous research ranged from 0.77 to 0.92. All of them are above 0.70, which considered as acceptable (Breaugh, 1985). The Cronbach α for team performance, team vision, team heterogeneity, team belief (team potency), team managerial support, team leader behaviour and team psychological safety are all considered acceptable (ranging from 0.74 to 0.86) (Campion, Medsker and Higgs, 1993; Edmondson, 1998, 1999; Kivimaki, Kuk, Elovainio, Thomson, Kalliomaki-Levanto and Heikkila, 1997). Cronbach α for team belief (team efficacy) showed a lower level of internal consistency with the value of 0.63 (Edmondson, 1999), but this is considered acceptable as recommended by Finklestien (1992).

Internal consistency for some items were similar to the values cited by the other authors, such as: work method autonomy, work criteria autonomy, team vision, team beliefs (team potency), team leader setting direction and team leader coaching. This suggested that these scales have adequate internal reliability in their original versions and in the form used here. While some differences were found between previous studies and the current one for some scales such as work schedule autonomy, team heterogeneity, team belief (team efficacy), team managerial support and team psychological safety. The current study showed lower Cronbach α in these scales compared with previous studies. The internal consistency for work schedule autonomy, team heterogeneity and team belief (team efficacy) were under 0.50, and for team psychological safety is under 0.60.

The internal consistency for PTPS is similar for communicator style in this study compared with the previous studies (0.52 and 0.55-0.65 respectively), while high Cronbach α was found for challenger and collaborator in this study (0.52 and 0.39) compared with (0.38-0.47 and 0.20-0.26) respectively (Kirnan and Woodruff, 1994). On the other hand,

Cronbach α for contributor was low in this study (0.39) compared with (0.51-0.59) in the previous research (Kirnan and Woodruff, 1994). It can be concluded that the Cronbach α for PTPS revealed a low internal consistency for contributor and collaborator styles. The current study showed the same low internal consistency in the collaborator style like the previous research (Kirnan and Woodruff, 1994).

Abaramson, Lane, Nagai and Takagi (1993) supported the idea of the use of students' samples in management research, which may give a more homogeneous and better-balanced sample. Kirnan and Woodruff (1994) used students' sample as well to demonstrate the reliability and validity of PTPS. The researcher intended to use students' samples to test the psychometric properties of PTPS before using it in Iron and Steel Co., but there were some practical limitations of doing so. The researcher got permission to use PTPS from CPP on the first of September 1999. This date was corresponded with the data collection permission date from Iron and Steel Co. Therefore, it would thought to run both at the same time (students and Iron and Steel Co.), but it was so difficult concerning the long distances between the two places in Alexandria. Therefore, although it was not ideal the researcher ran the PTPS study with the students' sample shortly after Iron and Steel Co. with the aim of adding knowledge to PTPS psychometric properties. The findings of the students' samples are presented in Appendix A.

The internal consistency reliabilities (Cronbach α) of the managers' rating of team performance and the managers' rating of team belief (team efficacy) were calculated as shown in Table 6.7.

Scale	**Reliability (Cronbach α)**
1- Managers' rating of team performance	0.45
2- Managers' rating of team belief (team efficacy)	0.31

Table 6.7 Cronbach α for the managers' rating scales.

6.5.2.2 Scale Inter-Correlations

Table 6.5 shows the Pearson Product Moment (PPM) correlation coefficient between each of the variables. The correlation coefficients (r) range between –1 and +1 and measure the strength of the linear relationship between the variables. The inter-correlation for the PTPS scale indicated that the four team player styles are related positively to each other ($p < 0.01$). The four PTPS are also statistically significant related with other variables such as: work criteria autonomy, team managerial support, and team leader behaviour in setting directions. There were different correlations observed between each team player style and other variables. The contributor style is positively related to work schedule autonomy, work criteria autonomy, and team managerial support ($p < 0.01$) and is also positively related to team leader directing behaviour ($p < 0.05$). The collaborator style is positively related to the three types of autonomy ($p < 0.01$). There is also statistically significant relationship between the collaborator style and team heterogeneity, team managerial support and team leader directing behaviour. Communicator style shows also a statistically significant correlation with self-rated team belief (team efficacy and team potency), work criteria autonomy, team heterogeneity, team managerial support and team leader behaviour. The challenger style revealed a statistically significant correlation with self-rated team performance, the three types of team autonomy, team heterogeneity, team beliefs (team potency) and team managerial support and team leader behaviours.

Inter-correlation for self-rated team performance show that statistically significant relationships exist between self-rated team performance and other variables from the scale such as: self-rated team belief (team efficacy and team potency), work schedule autonomy, team vision, team heterogeneity, team managerial support, team leader behaviours and team psychological safety. Self-rated team belief (team efficacy) on the other hand is positively and statistically significant related with all the variables except with work criteria autonomy and team heterogeneity and relative team size. There are statistically

significant correlations between work method autonomy and other variables of autonomy. There another statistically significant relations between work schedule autonomy and team leader directing setting. Team vision is positively and statistically significant related with team heterogeneity, self-rated team belief (team potency), team managerial support, and team leader behaviours and team psychological safety. Other statistically significant inter-correlations were found between team heterogeneity and self-rated team belief (team potency), team managerial support, and team leader directing, while self-rated team belief (team potency) is positively and statistically significant related to team managerial support, team leader behaviours and team psychological safety. Team managerial support has a positive statistically significant correlation with team leader behaviours and team psychological safety. Team leader is divided into two components: team leader behaviour in setting direction and team leader behaviour in coaching, both are positively and statistically significant related to each other and also positively and statistically significant related to team psychological safety. There are negative but not statistically significant relationships between relative team size and three styles of team player styles (contributor, collaborator and challenger), self-rated team performance, self-rated team belief (team efficacy), team autonomy (work method autonomy, work schedule autonomy and work criteria autonomy), team heterogeneity and team psychological safety. Clearly there are some statistically significant inter-correlations between the variables in the scale that used in the current study. To investigate these relationships further it was decided therefore to perform a factor analysis on the matrix of scale inter-correlations (see below).

6.5.2.3 Factor Analysis

Factor analysis is a data reduction or summarisation technique that is used to identify the structure of a set of variables and the dimensions that are latent within the data set (Hair, Anderson, Tatham and Black, 1995). Factor analysis as a statistical technique may be either exploratory or confirmatory (Kline, 1993; Child, 1995). Exploratory factor analysis

is used in scale development to simplify a large set of data, and to identify the most important variables (Kline, 1993) and it is also used to discover the structure in the variables used (Child, 1995). Confirmatory factor analysis is used to confirm a predetermined structure. Simply, it can be used to confirm hypotheses and test competing models.

Factor analysis was used in the current study to assess the inter-relationships of the selected variables, without imposing a predetermined structure (exploratory factor analysis was used to examine the proposed factors in the questionnaire). Hair *et al.* (1995) and Kline (1998) pointed out that the minimum sample size to run an exploratory factor analysis is 100 subjects. Moreover, the variables that are used in the factor analysis are assumed to be metric measurement, with several variables to make it useful to represent the proposed factors. The sample in the current study is 132 and is considered as an adequate basis for calculating the correlation between variables. Hair *et al.* (1995, p: 385) argued that exploratory factor analysis can be run at different sample sizes, with factor loading of 0.50 for sample size 120 and 0.45 for sample size 150. Therefore, in the current study, it was decided to use a factor loading of ≥ 0.50 as being significant.

Kline (1993), Hair *et al.* (1995) and Child (1995) stated that factor analysis is based on the correlations between variables. They suggested that correlation should be greater than 0.30 between variables in correlation matrix to ensure the appropriate use of factor analysis. The purpose is to identify the dimensions mathematically by examining the loading values on latent variables; higher loading values means more of the variance for a particular variable is accounted for by the factor. To ensure the appropriate use of factor analysis, two tests were conducted to assess the overall significance of the correlation matrix: the Bartlett Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy. The Bartlett Test of Sphericity is the statistical test for the presence of correlation among

variables. Measuring sample adequacy is a measure to quantify the degree of inter-correlation among variables, ranging from zero to one. Hair *et al.* (1995) suggested 0.50 to be an acceptable level for KMO. Once the measuring of the sample adequacy achieved an acceptable level, this can be used as a guide as to whether or not to proceed with the factor analysis.

The researcher chose principal components analysis (PCA) as a method of extracting the factors because of its ability to summarise the original information into a small number of principal components (factors) for prediction purposes. Kline (1993, p: 42) added that "in computing principal components all the variance in the matrix, including error variance, is explained" and also "the principal factor, by estimating communalities of the variables, attempt to exclude the error variance; which will make the principal factor a more accurate procedure". There are numbers of criteria as suggested by Kline (1993), Hair *et al.* (1995) and Child (1995) for the number of factors to be extracted. The most commonly used methods include latent root or eigenvalue criterion and the scree plot. The eigenvalue greater than 1.0 is a widely used technique to determine the number of factors to extract. The scree test criterion (Cattell, 1965) is another technique to identify the number of factors to be extracted. Some researchers suggested that the scree plot test is considered better than the latent root criterion (Hair *et al.*, 1995, p: 378, Kline, 1994). In practice, many researchers use the eigenvalue and scree plot tests to decide the number of the factors to be extracted, and it is also important to report the variance of these factors.

In the current study, the principal components analysis was carried out as described above. The Kaiser-Myer-Olkin KMO measure of the sample adequacy was 0.79. The Bartlett Test of Sphericity was statistically significant ($p < 0.001$) and showed that it is acceptable to proceed with the analysis. The number of factors to be extracted, according to the latent root or eigenvalue greater than 1.0 criterion, was five factors and these accounted for 68.39

per cent of the total variance (see Table 6.8). Plotting the eigenvalues against the order of extraction gives the scree plot (Cattell, 1965). The examination of the scree plot, which is shown in Figure 6.1 suggested that five factors should be extracted. Kline (1994) argued that scree plot test has some degree of subjectivity, and this could be one objection to it.

Scale	Unrotated component					Rotated component				
	1	2	3	4	5	1	2	3	4	5
Team player styles:	.70	-.20	-.37	-.11	-.11	.82	10	09	.01	-.01
Contributor	.73	-.39	-.05	-.04	-.05	.69	.05	.45	.01	.01
Collaborator	.77	-.05	-.41	.08	.03	.83	.16	.04	.23	.05
Communicator	.76	-.18	-.36	-.18	-.12	.86	.16	.10	.01	-.11
Challenger										
Team autonomy:										
Work method autonomy	.38	-.38	.62	-.18	-.06	.06	.14	.77	-.15	-.27
Work schedule autonomy	.43	-.31	.55	-.19	.07	.06	.10	.77	.07	.06
Work criteria autonomy	.51	-.48	.22	.20	.20	.35	-.15	.67	.15	.08
Team vision	.26	.54	.06	.07	.51	-.05	.30	-.06	.73	-.02
Team heterogeneity	.44	.23	-.04	.13	.68	.20	.05	.12	.82	-.01
Team managerial support	.58	.39	-.02	.04	-.16	.36	.59	.01	.18	.11
Team leader behaviour:										
In directing	.60	.43	.23	.17	-.18	.20	.72	.20	.19	.19
In coaching	.46	.53	.33	-.01	-.34	.04	.84	.11	.01	.02
Team psychological safety	.26	.58	.01	-.40	-.06	.02	.62	-.19	.16	-.36
Relative team size	-.01	.16	-.14	.86	-.26	-.04	.08	-.08	-.01	.91
Eigenvalue	4.02	2.03	1.36	1.10	1.05					
% variance	28.72	14.56	9.77	7.86	7.48					

Table 6.8 The rotated and unrotated factor matrix (loadings ≥ 0.50 underlined). Zeros are omitted from the factors loadings.

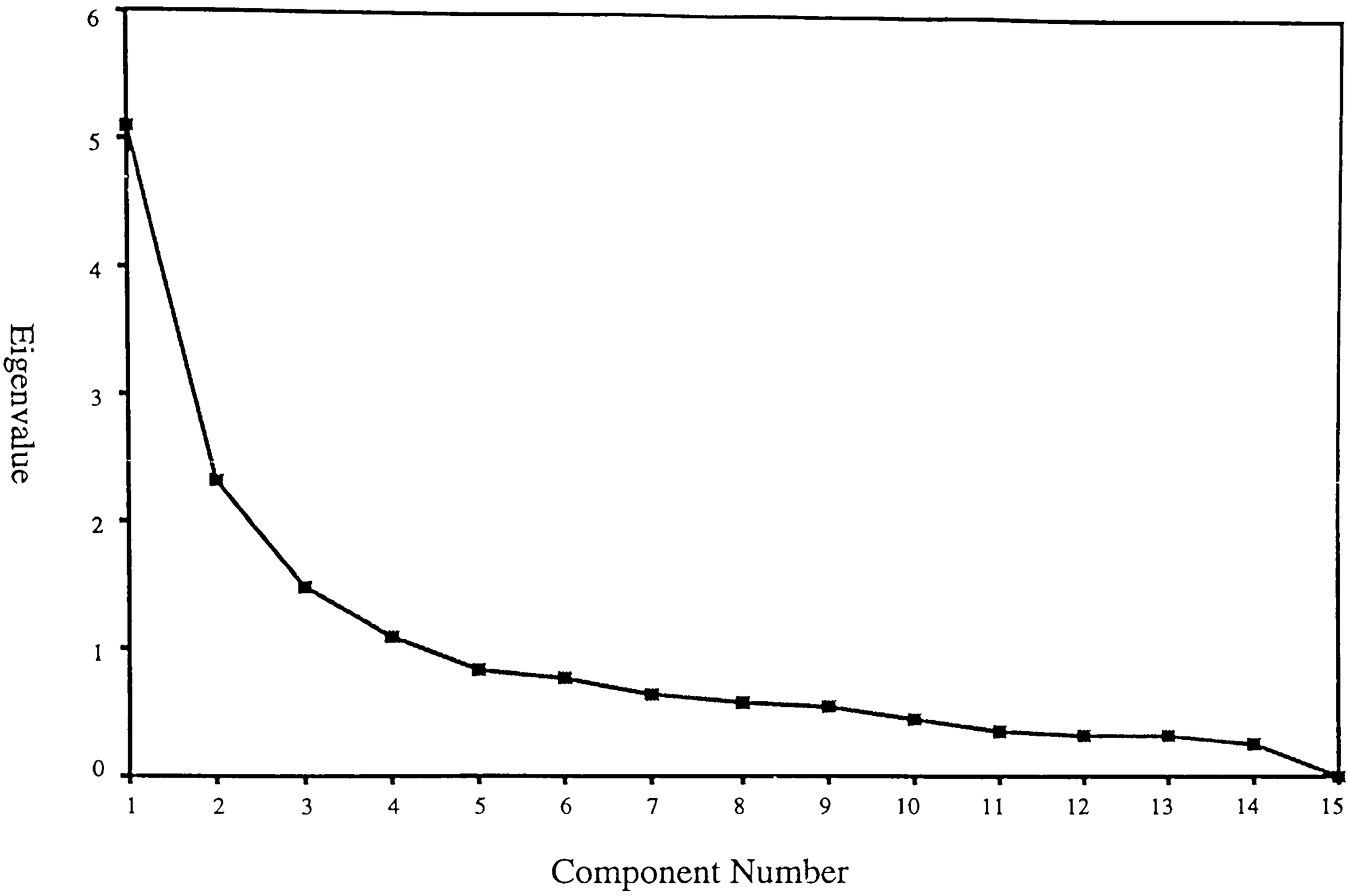


Figure 6.1 The scree plot test.

In the scree plot test the point at which the curve begins to straighten out indicates the maximum number of factors to be extracted (Hair *et al.*, 1995). In the present case, it suggested five factors. The results of both latent roots and scree plot test provided the same number of factors to be extracted and so five factors were extracted. Child (1995) suggested that the unrotated often solution fails to produce an effective interpretation of the variables that are examined. An orthogonal rotation method was used to facilitate this interpretation by using the rotated factor matrix. Orthogonal rotational approaches are more widely used because all computer packages with factor analysis contain orthogonal rotation options of which there are three major methods (quartimax, varimax and

equimax). Varimax method of rotation helps to give a clear separation of the factors, and it has proved very successful analytical approach to rotate factors (Hair *et al.*, 1995). It is the default method in many packages and is widely used. Varimax method is the appropriate solution to reduce the large number of variables to a small set of variables, and it will give also the simplest explanation to the factors (Kline, 1995). Small number of variables with high loading needed for the significance of the factor loading (Hair *et al.*, 1995). Factor loading greater than ± 0.30 are considered to meet the minimal level, ± 0.40 are considered as significant to meet the more important level, ± 0.50 or greater are considered significant and it depends on a sample size (Hair *et al.*, 1995).

There are four scales that load on Factor 1 (all with factor loading of over 0.60). There is a clear association between variables within this factor, all of the four items in this factor are the team player styles (contributor, collaborator, communicator and challenger). Hence it is easy to label this factor as 'team player styles'. Factor two comprises four scales and is concerned with management issues of teamwork. The scales are team managerial support and team leader behaviours; in directing and in coaching and also there is another item related to the team psychological safety. This factor could be labelled 'team managerial issues'. Three scales loaded on Factor 3 with factor loadings of over 0.60. These three variables are all concerned with aspects of autonomy inside the team. Hence the factor is easily labelled 'team autonomy'. Factor 4 is made up of another two scales (all of which have factor loading of over 0.70). This factor is concerned with team vision and team heterogeneity. This factor is labelled 'team internal relations'. Factor 5 comprises one scale, which is the relative team size with a factor loading of over 0.90. The label for this factor is 'relative team size'.

As a result of the individual level of analysis, it can be concluded that there are some significant relationships between the variables in the proposed model. Also, based on the

factor analysis results, these variables are grouped into five main factors. The following section will focus on the relationships between these factors at the group level of analysis (see below).

6.5.3 Group Level of Analysis

The analysis at the group level with all teams in the chosen sample was conducted as follows:

6.5.3.1 Descriptive Statistics

The descriptive statistics (means and standard deviations) and the inter-correlations for the teams (19 teams) were computed as shown in Table 6.9. It should be noted that in all teams the variables' means are above the scale mid-point (3.00) except for the relative team size variable.

6.5.3.2 Inter-Correlations

Table 6.9 shows the Pearson Product Moment (PPM) correlation coefficient between each of the variables at the group level of analysis. The inter correlation for the PTPS scale at the group level indicated that the contributor style is positively related to communicator and challenger styles ($p < 0.01$), the challenger style is positively related to communicator style ($p < 0.05$). But the other team player styles are not related to each other. The contributor style is positively related to self-rated team belief (team efficacy) ($p < 0.01$) and is positively related to managers' rating of team performance ($p < 0.05$). The collaborator style is positively related to the autonomy variables (work methods autonomy, work schedule autonomy and work criteria autonomy) and team heterogeneity ($p < 0.05$). The communicator style shows a positive correlation with team leader directing ($p < 0.01$) and self-rated team beliefs (team efficacy and team potency). team heterogeneity and team

managerial support ($p < 0.05$). The challenger style reveals positive correlations with self-rated team belief (team efficacy) ($p < 0.01$) and team leader directing ($p < 0.05$).

The inter-correlation for self-rated team performance show that there is a positive relationship with self-rated team belief (team potency) ($p < 0.05$). Self-rated team belief (team efficacy) is positively related with work method autonomy and team leader directing ($p < 0.01$).

Work method autonomy is positively related to work criteria autonomy and team psychological safety ($p < 0.05$). Work schedule autonomy is positively related with work criteria autonomy and self-rated team belief (team potency) ($p < 0.05$). There are positive relationships between work criteria autonomy and team heterogeneity, self-rated team belief (team potency), team managerial support and team leader directing ($p < 0.05$). Team vision is positively related with team managerial support ($p < 0.01$). Team heterogeneity is positively related with team leader directing ($p < 0.05$), while self-rated team belief (team potency) is positively related to team leader behaviours (directing and coaching) ($p < 0.01$). There is a positive correlation between team managerial support and team leader directing ($p < 0.05$). Team leader directing is positively related at the same time with team leader coaching ($p < 0.01$). This means that team leader behaviour variables (directing and coaching) are positively related to each other. Team leader coaching is positively related to team psychological safety ($p < 0.05$). Team psychological safety is negatively related to relative team size ($p < 0.05$). In general, the inter-correlations indicated that there is some positively and statistically significant inter-correlation between the variables in the scale that used in the current study at the group level. While there are also negative correlations between some of the variables and the relative team size. This could indicate that the team members in each team would like to have more people in their teams (see discussion for details). The next part will discuss the issue of balanced teams at the group level of analysis.

Scales	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.Contributor	4.23	0.13																			
2.Collaborator	4.05	0.23	30																		
3.Communicator	4.09	0.19	68**	26																	
4.Challenger	4.13	0.14	69**	31	47*																
5- self- rated team performance	3.87	0.20	20	-15	17	03															
6. Self rated team belief (efficacy)	3.72	0.33	65**	39	54*	59**	32														
7. Work Method Autonomy	3.93	0.38	30	55*	34	44	19	70**													
8. Work Schedule Autonomy	3.96	0.32	37	51*	10	25	15	31	39												
9. Work Criteria Autonomy	3.59	0.46	29	53*	33	22	-02	37	49*	56*											
10. Team Vision	4.10	0.28	26	25	25	06	03	34	08	20	35										
11. Team heterogeneity	3.71	0.32	27	54*	61*	12	-04	37	39	11	48*	14									
12. Self-rated team belief (team potency)	4.21	0.36	31	34	47*	21	53*	37	45	49*	53*	19	38								
13. Team managerial Support	4.03	0.77	31	32	54*	23	02	30	12	34	54*	74**	37	40							
14.Team Leader Directing	4.05	0.38	41	37	68**	46*	18	62**	37	44	46*	22	57*	60**	54*						
15.Team Leader Coaching	4.18	0.36	21	29	29	12	37	44	26	44	21	28	30	58**	25	64**					
16. Team psychological Safety	3.51	0.34	-05	33	10	-00	22	36	46*	15	33	32	04	31	04	14	47*				
17. Relative team size	2.79	1.18	-08	-05	-30	06	-01	-23	-36	07	-02	20	-20	-18	29	-18	-24	-56*			
18.Managers'rating of team performance	3.80	0.29	57*	20	44	45	16	40	14	15	30	19	10	16	42	24	04	21	-09		
19. Managers' rating of team belief (team efficacy)	3.69	0.26	-39	-05	-15	-40	-11	-10	13	-25	-31	01	-14	-36	-13	-32	-06	22	-22	-19	--

Table 6.9 Descriptive statistics and inter-correlations at group level of analysis. Zeros and decimal points omitted from correlations. Note: * $p < 0.05$, ** $p < 0.01$.

6.5.3.3 Team Balance

Senior (1997) noted that the issue of balanced teams is an important one. Belbin (1981) claimed that in order to predict the team performance, a knowledge of each team member's team role is needed, which he called 'team balance'. Senior (1997) argued that the way that Belbin thought of the balanced team does not differ from the other team role theorists on this issue. She argued that there are different ways to measure balanced team. To measure the team balance in the current study the team balance mix was calculated as shown below.

Team Balance Mix

The method that used to identify balanced teams was by calculating the team balance mix as suggested by Parker (1990). Parker argued that the balanced teams must encompass of the four team player styles. In his original ipsative long version of PTPS the balanced team should equal a total of 180 for all team player styles. In the current study because the use of a normative short version of PTPS that consists of 10 statements with a total of 40 items. I would argue that a new approach could be followed to compute the score for team balance, which might help to provide a new approach to measurement. By following the same idea presented by Parker, the balanced team that consists of the four team player styles should on average equal a total of 4 in the current study and any team that got less than 4 (i.e. 3, 2 or 1) should considered as a non-balanced team.

A balanced team was computed here by re-coding the four team player styles means into new variables as shown in Table 6.10. For example: in team number one, if the average team style ranged between 4 and 5, it transferred into 1 and if the average is less than 4 (i.e. 3, 2 or 1) this will transfer into zero. Then a total of the four new variables of the four-team player styles were computed:

Total score of team player styles = Contributor + Collaborator + Communicator + Challenger

The total score of team player styles should equal 4 to have balanced team. A total score of 3 or less means the team is non-balanced (that is lacks one or more of the styles). Then a new variable was computed to identify the balanced and non-balanced teams. Only teams with a total score of team player styles equal 4 is considered balanced.

This new measure of balanced teams may achieve the Parker's idea of having the four team player styles in a team to have balanced teams. This is based on a normative short version of PTPS, which thought to solve the ipsative problems. Table 6.10 shows the balanced and non-balanced teams for Iron and Steel company.

Team number	Con (M)	Coll (M)	Com (M)	Chal (M)	Higher Con	Higher Coll	Higher Com	Higher Chal	Total	Balanced / non-balanced teams
1	4.32	4.16	4.31	4.29	1	1	1	1	4	1
2	4.23	3.93	4.00	4.15	1	0	1	1	3	1
3	4.20	4.17	4.02	3.95	1	1	1	0	3	0
4	4.19	4.09	4.02	4.09	1	1	1	1	4	1
5	3.95	3.70	3.75	3.75	0	0	0	0	0	0
6	4.14	4.02	4.00	4.20	1	1	1	1	4	1
7	4.20	3.93	4.03	4.03	1	0	1	1	3	0
8	4.03	4.20	4.13	4.03	1	1	1	1	4	1
9	4.30	4.09	4.06	4.11	1	1	1	1	4	1
10	4.05	4.13	4.03	4.03	1	1	1	1	4	1
11	4.20	4.27	3.83	4.30	1	1	0	1	4	1
12	4.40	4.00	4.20	4.35	1	1	1	1	4	1
13	4.26	4.18	4.21	4.17	1	1	1	1	4	1
14	4.35	4.10	4.38	4.23	1	1	1	1	4	1
15	4.30	4.12	4.08	4.18	1	1	1	1	4	1
16	4.15	3.80	3.78	4.02	1	0	0	1	2	0
17	4.34	4.08	4.16	4.22	1	1	1	1	4	1
18	4.12	4.02	4.05	4.24	1	1	1	1	4	1
19	4.41	4.42	4.44	4.42	1	1	1	1	4	1

Table 6.10: The balanced and non-balanced teams for Iron and Steel Co.

B= 1 for balanced team, NB= 0 for non-balanced team.

Table 6.11 shows the Pearson Product Moment (PPM) correlation coefficient between team player styles (overall average team player styles M), team autonomy, team internal relations, team managerial issues, relative team size, self-rated team beliefs (team efficacy and team potency), self-rated team performance, managers' rating of team belief and managers' rating of team performance. There are positive and statistically significant relationships found between team player styles (M) and team autonomy, team internal relations, team managerial issues, self-rated team belief (team efficacy) ($p < 0.01$) and self-rated team belief (team potency) and managers' rating of performance ($p < 0.05$). Team autonomy is positively related to team internal relations and self-rated team beliefs (team efficacy) ($p < 0.05$) and to team managerial issues and self-rated team belief (team potency) ($p < 0.01$). Team internal relations are positively related to team managerial issues ($p < 0.01$) and self-rated team belief (team efficacy) ($p < 0.05$). Team managerial issues are positively related to self-rated team belief (team efficacy) ($p < 0.05$) and self-rated team belief (team potency) ($p < 0.01$). Self-rated team belief (team potency) is positively related to self-rated team performance ($p < 0.05$).

Items	1	2	3	4	5	6	7	8	9	10
1. Overall Team player styles (M)	--	.61**	.58**	.59**	.10	.69**	.46*	.05	-.28	.51*
2. Team autonomy		--	.46*	.59**	-.05	.57*	.61**	.12	-.18	.26
3. Team internal relations			--	.73**	-.03	.47*	.39	-.01	-.09	.19
4. Team managerial issues				--	-.22	.56*	.63**	.22	-.12	.37
5. Relative team size					--	-.20	-.14	-.43	-.37	.19
6. Self-rated team belief (team efficacy)						--	.37	.32	-.10	.40
7. Self-rated team belief (team potency)							--	.53*	-.36	.16
8. Self-rated team performance								--	-.11	.16
9. Managers' rating of team belief (efficacy)									--	-.19
10. Managers' rating of team performance										--

Table 6.11 Team Balanced correlations. *Note:* *$p < 0.5$, **$p < 0.01$, ***$p < 0.001$. Zeros are omitted from the correlation matrix.

Team balance and non- team balanced comparison

To assess the differences in effectiveness between balanced teams and non-balanced teams *t*-tests were performed. The test compared balanced and non-balanced teams' effectiveness through all variables in the scale that used in the current study as resulted from the factor analysis as shown in Table 6.12.

	Balanced Teams		Non balanced Teams		$t_{1,17}$	*p*
	M	**SD**	**M**	**SD**		
1. Team autonomy	3.87	(.26)	3.73	(.42)	.86	.20
2. Team internal relations	3.96	(.18)	3.78	(.28)	1.69	.05
3. Team managerial issues	4.02	(.29)	3.76	(.37)	1.68	.05
4. Relative team size	2.66	(.83)	2.44	(.44)	.59	.56
5. Self-rated team beliefs:						
Team efficacy	3.78	(.26)	3.60	(.43)	1.09	.14
Team potency	4.20	(.40)	4.23	(.28)	-.15	.44
6. Self-rated team performance	3.84	(.22)	3.96	(.14)	-1.23	.12
7. Managers' rating of team beliefs (team efficacy)	3.69	(.29)	3.66	(.21)	.19	.43
8. Managers' rating of team performance	3.89	(.29)	3.61	(.20)	2.09	.03

Table 6.12 Balanced teams and non-balanced teams *t-test (one tailed test).*

Table 6.12 shows the *t*-test results for balanced and non-balanced teams, with a one tailed test, since definite predictions were made about the direction of any relationships (Bryman and Cramer, 1999). Wright (1997, p: 81) noted that "one-tailed tests are always more powerful", but the chance of making Type I error that means the possibility to reject a true hypothesis still exists. A one tailed test is appropriate also, because it helps on making a specific prediction about the direction of the differences which is needed to assess the differences between the means of balanced and non-balanced teams in the current study. Marginally significantly differences between means ($p = 0.05$) were found on team internal relations and team managerial issues and between balanced and non-balanced teams. These

differences were in the same direction as expected that the balanced teams outperform the non-balanced teams. While, there was a statistically significant difference found between means ($p < 0.05$) on managers' rating of team performance. This was in the expected direction. This indicated that there do appear to be some differences between balanced and non-balanced teams, and from the means, it seemed that it was in the expected direction for all variables except for self-rated team belief (team potency) and self-rated team performance; in which the non-balanced teams reported themselves higher than the balanced teams.

6.6 Discussion

The aim of this chapter was to evaluate the proposed model of team work effectiveness in one Egyptian company. The chapter started with developing the instrument for the study and ended up with running the main study on the chosen company (Iron and Steel Co.). The results of this study were derived from two levels of analysis; individual level and group level. The aim of the individual level of analysis was to test the reliabilities of the scales, to evaluate any relationships that exist among the scales. Also, the individual level of analysis aimed to identify the structure of the variables that used in the scale, to examine the underlying factors in the scale used. The results from the individual level of analysis indicated that the internal reliabilities when compared with previous studies were quite variable. Also, the results indicated that the four team player styles are positively related to each other and also are related to the variables. Autonomy aspects are positively related to each other and to some other variables in the scale. Also, team performance measures (self-rated and managers' rated) and team beliefs measures (self-rated and managers' rated) are related to different variables in the scale. For example, there are positive relationships between self-rated team performance and self-rated team belief (team efficacy and team potency), work schedule autonomy, team vision, team heterogeneity, team managerial support, team leader behaviour (directing and coaching) and team psychological safety.

Results indicated that there were positive relationships between self-rated team belief (team efficacy) and all the variables in the suggested model except the work criteria autonomy and team heterogeneity and relative team size. Moreover, there are different relationships found between all variables with each other. Some of them are statistically significant related to each other, while others are not. As a result of the various relationships that found among the variables, a factor analysis was performed to identify the underlying (latent) structure of the variables in the scale (to help modify the hypothesised model). At the individual level of analysis, five factors were suggested as a result of an exploratory factor analysis on the scale. The factors were labelled as: team player styles, team autonomy, team internal relations, team managerial issues and relative team size. One of the important issues is the idea of balanced team and its relationship with team performance. Some authors argued that balanced teams outperform non-balanced teams and that high performance is related to teams balance, for example: Belbin (1981), Margerison and McCann (1985) and Parker (1990). Therefore, a group level of analysis was used to compute the balanced team scores and then evaluate the relationships between balanced teams, other variables in the suggested model and team performance as an indicator of team effectiveness.

On the group level of analysis, team performance was measured with two dimensions; self-report and manager's report. On the self-report dimension, there was a positive and statistically significantly relationship found between the self-rated team performance and self-rated team beliefs (team potency). On the managers' rating of performance, there was a positive and statistically significant relationship between the contributor style and the managers' ratings of team performance (Table 6.9). There are also some statistically significant relations found between the factors as resulted from the factor analysis. For example, there are positive relationships between team player styles, team autonomy, team internal relations, team managerial issues and relative team size. There is also a positive

relationship between PTPS (M) and managers' rating of team performance. The important reason for running the group level of analysis was to compute the balanced teams and non-balanced teams to evaluate its effectiveness.

Team balance mix was used to calculate the balanced teams and non-balanced teams. The aim was to explore how to measure balanced teams, and to evaluate if this indicator can produce significant results in its relation with self-report of performance and managers' report of performance and with all the other variables in the proposed model.

A group level of analysis was used, besides the above reasons, with the aim to discuss the hypotheses of the study as follow:

Hypothesis 1

There are differences between the effectiveness of balanced and non-balanced teams. (H1)

The first hypothesis aimed to test the relationship between team balanced and team effectiveness. To test this hypothesis, a correlational analysis and *t*-tests were used. The analysis was done with all variables in the current study. It can be seen from the correlations in Table 6.11 that there were some positive relationships between the overall team player styles (M), team autonomy, team internal relations and team managerial issues ($p < 0.01$). There was a positive relationship between the overall team player styles (M) and self-rated team belief (team efficacy) ($p < 0.01$), and self-rated team belief (team potency) ($p < 0.05$). There was a positive relationship found between the overall team player styles (M) and the manager's rating of team performance ($p < 0.05$). Team autonomy was positively correlated with self-rated team belief (team efficacy ($p < 0.05$) and self-rated team belief (team potency) ($p < 0.01$), with team internal relations ($p < 0.05$) and team managerial issues ($p < 0.01$). Team internal relations were positively correlated

with team managerial issues ($p < 0.01$), and with self-rated team belief (team efficacy) ($p < 0.05$). Team managerial issues were positively correlated with self-rated team belief (team efficacy ($p < 0.05$) and self-rated team belief (team potency) ($p < 0.01$). Also, self-rated team belief (team potency) was positively related with self-rated team performance ($p < 0.05$). Then using *t*-test (one tailed), it appears that there was some support with a marginally significant at $p = 0.05$ for the differences between balanced and non-balanced teams for team internal relations and team managerial issues. These differences were in the expected direction. While there was a difference found between balanced and non-balanced teams for managers' rating of team performance ($p < 0.05$), this also was in the expected direction. The differences between balanced and non-balanced teams were in the expected direction for all the variables except for the self-rated team belief (team potency) and self-rated team performance. This indicated that there appear to be some differences between balanced and non-balanced teams, and from the means, it seemed that it was in the expected directions for some of the variables in the model. Also there is a statistically significant difference in the expected direction for the managers' rating of team performance, which support the differences between balanced and non-balanced teams, this means accept H1.

Hypothesis 2

Team beliefs are positively associated with balanced team player styles and team design variables. (H2)

For Hypothesis 2, the results from the correlation matrix (Table 6.11) indicated that team player styles (M) were positively correlated with self-rated team belief (team efficacy $p < 0.01$ and team potency $p < 0.05$), team autonomy ($p < 0.01$), team internal relations ($p < 0.01$), team managerial issues ($p < 0.01$), managers' rating of team performance ($p < 0.05$). Team autonomy was positively correlated with self-rated team belief (team efficacy) and

team internal relations ($p < 0.05$) and with team managerial issues and self-rated team belief (team potency) ($p < 0.01$). Team internal relations were positively correlated with team managerial issues ($p < 0.01$) and with self-rated team beliefs (team efficacy) ($p < 0.05$). Team managerial issues were positively related with self-rated team belief (team efficacy) ($p < 0.05$) and self-rated team belief (team potency) ($p < 0.01$). Self-rated team belief (team potency) was positively related to self-rated team performance ($p < 0.05$). However, a more advanced analysis like analysis of covariance (ANCOVA) or multiple regression is required. The small number of the sample used teams in this study (which provides a small data set) meant that it was not advisable to run this type of analysis.

There are many relationships between the variables. So it would be thought better to do it in the second study with a larger number of teams and a larger data set to be able to run a suitable analysis to test these hypotheses.

Hypothesis 3

Team performance is positively associated with team beliefs. (H3)

Hypothesis 4

Team performance is positively associated with balanced team player styles, team design variables and a positive team belief. (H4)

For Hypothesis 3, There was a significant relationship found between self-rated team belief and self-rated team performance ($p < 0.05$), also there are some correlations between team player styles, team internal relations, team managerial issues and managers' rating of team performance. But, the correlations were not able to explain the combine effect of balanced team player styles and team design variables on team performance. However, a more advanced analysis like multiple regression is required to test this hypothesis.

For Hypothesis 4, From the correlation matrix at the group level of analysis, there were different correlations found between team player styles and self-rated team beliefs (team efficacy and team potency), and with managers' rating of team performance and between autonomy and self-rated team beliefs (team efficacy and team potency). Also, the correlation matrix indicated that there were some significant relationships found between team internal relations, team managerial issues and self-rated team beliefs. Also, self-rated team belief (team potency) is positively and statistically significant related to self-rated team performance. It appeared that there were some relationships among the variables in the scale. To measure the effect of two or more variables on team performance an advanced analysis like analysis of covariance (ANCOVA) or multiple regression are required.

6.7 Limitations of the study

There were various limitations found in this study, as a result of a number of different factors. First, there were some restrictions from the Egyptian context in general to conduct any research. Also, there was no previous research found to describe the application of team work in Egyptian organisations. There are some descriptions of team working but these are related to each company. Therefore, to use any information from these descriptions, a specific permission is needed from each company. Therefore, the researcher had to survey a number of Egyptian organisations herself to identify those companies that implement team work concept and then to be able to choose the sample for the study. The researcher just focused on the companies that are located in Cairo and Alexandria, because of the difficulty of surveying all the companies in Egypt (see Chapter One for the Egyptian pilot study survey). The researcher faced some other restrictions from the first chosen company after she got the permission to collect the data (to get that permission a lot of procedures needed to be followed starting from June 1999 till September 1999). The access to the company was limited to specific period of time (September 1999). This time

was correspondent with the permission date from the CPP to use the PTPS survey in the research. Therefore, the researcher had not got enough time to test the reliability of the questionnaire before collecting the data from the chosen company (see Appendix A for the reliability estimates of PTPS). The researcher asked the company to delay collecting the data for three months but this was rejected. The access was given to the researcher to collect the data once, therefore, the researcher was not able to compare the team members' effectiveness after any specific period of time. Also a longitudinal study was not possible because of access difficulties.

The researcher obtained permission from the chosen company to collect the data from the team members, but she was not allowed to distribute or collect the questionnaires herself. The company thought that it might waste the company time, therefore a manager distributed collected the questionnaires from each team members and the researcher collected them back from that manager. This way of collecting the data might affect the respondents' response, because they might think that the questionnaire is related to aspects of management control and this might affect their honesty in replying.

The permission was given only to collect data from the administrative team members and not to deal with any team members in the factory site for operational reasons. The researcher aimed to collect data from different departments in the chosen company to be able to evaluate the team work effectiveness for the all company, but with the limited data collection access to certain departments the evaluation would be difficult.

Two questionnaires were distributed with different languages, Arabic for the team members and English for the managers of each team. It was better to use both questionnaires in the same language but not all the team members could understand

English well. Therefore, the questionnaire was translated into Arabic to be sure that all the words in the questionnaires are understandable to all team members.

Some respondents refused to complete the questionnaires (I was informed by the manager who collected the questionnaires from the team members) because they were not familiar with the self-evaluation scales. They preferred to be evaluated by their managers not by themselves. The length of the questionnaire was criticised by one manager in the chosen company that it might lead the respondents to feel tired or get bored with it. As a result of having different team members' perceptions and attitudes, their ability to understand the questionnaires might be different. Besides, the design of the questionnaire (with common method bias) could lead the respondents to just tick the boxes as they used to read it in the first page. There is a need to measure the social desirability along with the various research variables.

6.8 Conclusion

Some conclusions can be drawn from the individual level of analysis and the group level of analysis in the current study. At the individual level of analysis it can be concluded that there are some statistically significant inter-correlations between the variables in the scale that used in the current study. And as a result from the factor analysis, some variables are grouped together in different factors according to their relatedness, which helped to identify the structure of the variables that used in the scale. These factors are: team player styles, team autonomy, team internal relations, team managerial issues and relative team size. At the group level of analysis it can be concluded that there are some statistically significant relationships found between the variables in the current scale. From the balanced and non-balanced team comparison it can be concluded that balanced teams are much more effective than the non-balanced teams for team autonomy, team internal relations, team managerial issues, relative team size, self-rated team belief (team efficacy)

and managers' rating of team beliefs and managers' ratings of team performance. Because of the small number of teams found in this study, testing Hypothesis 1 only was applicable, while the other hypotheses are need to be examined with a large number of teams in another study. Also, based on the results means were above the mid-point, therefore, it was the intention to test the social desirability of the scales among team members in the second study to explore this problem further. As a result of both individual and group level of analysis the following model is recommended for the next study as shown in Figure 6.2 below.

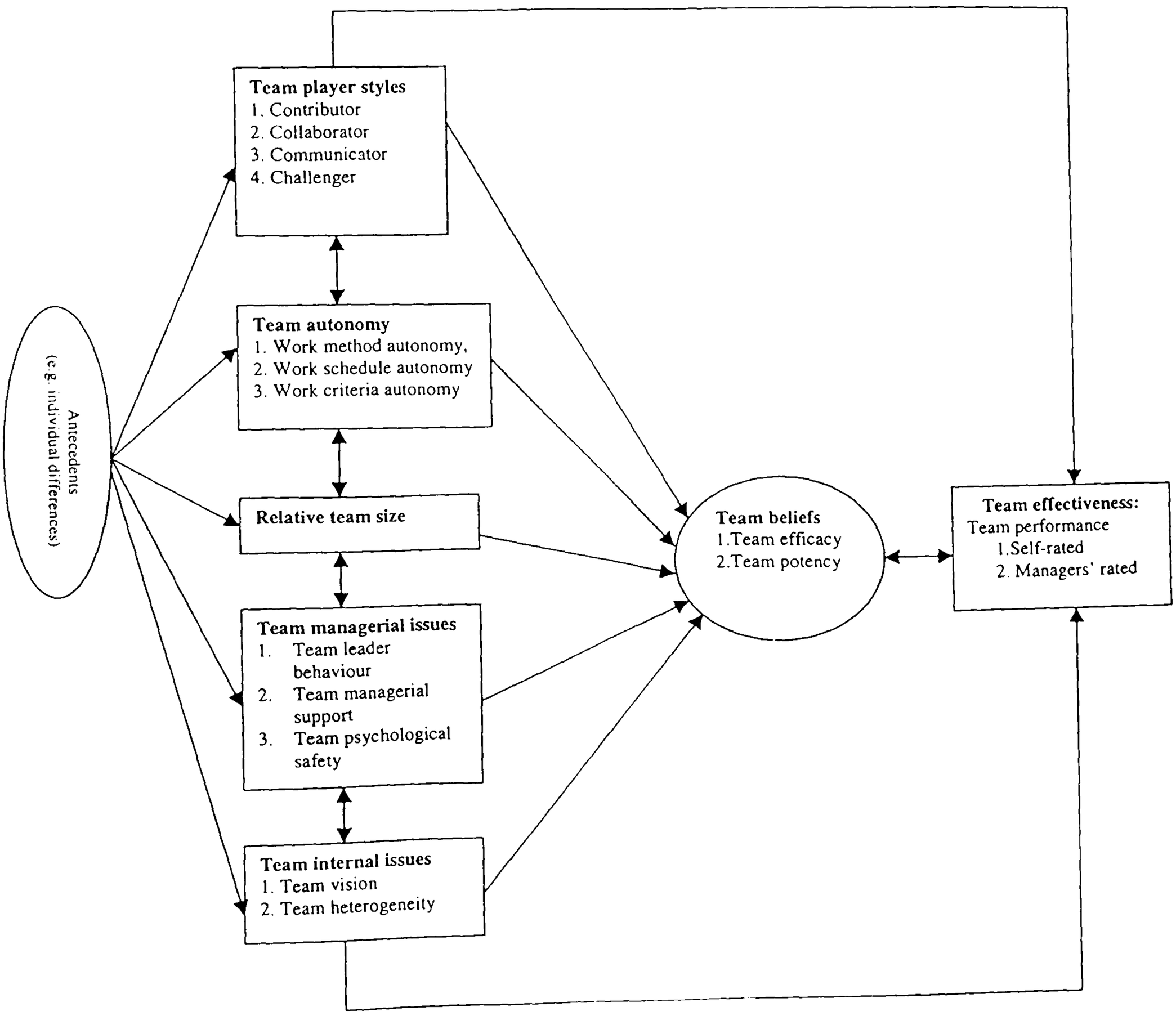


Figure 6.2 The first revised team effectiveness model.

6.9 Summary

This chapter has examined the development of the instrument and the variables used in the current study along with the pilot study that had taken place before carrying out the main study on the chosen company (Iron and Steel Company). By examining the team work in Iron and Steel company, a sample was chosen to take part in the current study. The analysis was run at two levels; individual level and group level of analysis. Some conclusions were drawn from both levels of analyses that helped to evaluate the team effectiveness according to the proposed model of team work effectiveness in Egypt. It was suggested that some modifications are needed, which are presented in a revised team effectiveness model (Figure 6.2) to be tested in the second study with a larger number of teams. The next chapter will focus on testing the revised model in another large successful Egyptian manufacturing company.

Chapter Seven: Study Two

Mantrac Co.

7.1 Introduction

Study Two was conducted in a large manufacturing company, who consider themselves to be the world's best heavy-equipment supplier who provide "superlative customer service in Egypt" (Mantrac Annual Report, 1999-2000). This company was chosen because it is an important economic force in many aspects of Egypt's recent growth and development. The company is situated in El-Amerya, Alexandria-Cairo Desert Road, Egypt. The study in the second company (Mantrac Co.) began with a small number of interviews with managers and then a large-scale questionnaire survey was used as explained in detail later in this chapter. This chapter describes the history of Mantrac Company and evaluates its role in the Egyptian economy and the Middle East generally. The chapter will focus on the description of the use of teams in different departments in the company. Another section will focus on the data collection and explain the modified questionnaire from Study One that was used in this company and was analysed at the individual and group levels. The final section brings together the findings of the results and summarises the main points made in this chapter and presents further refinements to the model of team work effectiveness.

7.2 The revised questionnaire

For the reasons outlined in the methodology chapter and to complement Study One it was decided to use a questionnaire survey in Study Two. The results from the first study led to the conclusion that some variables may be grouped together. Therefore, the same questionnaire that was used in Study One was used in Study Two with some modifications. It was decided to set the modified Arabic questionnaire version into eight main categories; team player styles, team performance, team design variables, internal team relations, team managerial issues, team beliefs, social desirability and some biographical information as described below. The reasons for this were to test the relationships that exist among the

variables in the revised model that resulted from Study One and to test the relationship between the scales used in this study and social desirability.

7.2.1 Team player styles

As described in the previous chapter (Study One) the same questionnaire was used in this study without any modification as a normative short Arabic version of PTPS.

7.2.2 Team performance

Hackman's scale (1990) was used to evaluate team performance in this study as used in the pervious study without any modification.

7.2.3 Team design variables

Team autonomy and relative team size variables were used to assess the team design variables in this study. The same questionnaire was used in the same order as used in Study One.

7.2.4 Internal team relations

In this part of the questionnaire it was suggested as a result from Study One to group team vision and team heterogeneity together. In this study the same statements were used but in one section randomly ordered.

7.2.5 Team managerial issues

In this section, team managerial support, team leader behaviour and team psychological safety were combined together to be considered as a team managerial issues as a result of Study One.

7.2.6 Team beliefs

In this section, team efficacy and team potency were used in this study without any modification.

7.2.7 Social desirability

An important change from Study One was the inclusion of a measure of Social Desirability. Vella-Brodrick and White (1997) suggested that scale developers should avoid response sets such as social desirability. Stober (1999) pointed out that the Social Desirability Scale (SDS) by Crowne and Marlowe (1960) continues to be used widely. Marlowe and Crowne (1960) developed a social desirability scale according to different psychological models, which consists of 33-dichotomously scored items. Social desirability according to them is "a definition of a population of culturally acceptable and approved behaviours, which are, at the same time relatively unlikely to occur" (Marlowe and Crowne, 1960, p: 354). While Edwards (1957, p: 3) argued that social desirability means "the scale of values for any personality statement such that the scale value indicates the position of the statement on the social desirability continuum". Vella-Brodrick and White (1997, p: 127) defined social desirability by referring to "a pattern of responses which reflects a person's need to give socially desirable response rather than report their actual behaviour of feelings". Greenwald and Satow (1970, p: 131) argued that to check the respondents' behaviour, "one often examines the degree to which the subjects' social desirability scores and their responses are related or uses marker items in a factor analysis".

Many researchers have devised a number of short forms of the Social Desirability Scale (SDS) (Reynolds, 1982; Strahan and Gerbasi, 1972 and Ramamaiah, Schill and Leung, 1977) because of the difficulty of using Marlowe-Crowne Social Desirability Scale due to its length. Therefore, Fischer and Fick (1993) tried to establish the adequacy of short forms

of the scale in measuring the social desirability. Their results found that the short forms of the SDS can be used with level of internal consistency, which compare favourably with the original SDS. They recommended form X1 and X2 by Strahan and Gerbasi (1972) to provide the best measure of social desirability. Fischer and Fick (1993) found that form X1 seems the scale of choice for social desirability among all other short forms. They found that the X1 form has high internal consistency and is highly correlated with the standard 33 items of the original scale of Marlowe-Crowne. This revised form X1 has only seven items and is short in length for a social desirability measure. Streiner and Norman (1995) and Vella-Brodrick and White (1997) suggested that the social desirability is calculated by correlating the scores of other scales with the social desirability scale scores. Pearson Product Moment (PPM) correlations should not be statistically significant, this indicates that the scale that used with the respondents did not elicit a socially desirable response.

Therefore, the short form X1 of SDS that was developed by Strahan and Gerbasi (1972) was used as a social desirability measure in this study. By using the dichotomously scored X1 form of the social desirability scale, calculating correlations between the scales that are used in the current study and the short form X1 of social desirability scale will help to validate the research scales in terms of socially desirable responses. The X1 form was translated into Arabic by the researcher. The back-translation was made by a professional translator from Arabic to English and was examined by another English native language professional, to compare between the original X1 form and the back-translation form (both in English). Few corrections were suggested to ensure semantic matches between the two versions. This was the same translation procedure that followed to translate the questionnaire used in Study One. After the translation procedures, a new section was added to the questionnaire to test the SDS in the Mantrac sample (see Appendix C for items).

7.2.8 Biographical information

The same questions were used in this section as were used in the previous study.

7.3 Pilot study

It was considered important to conduct a pilot study to test the revised instrument before carrying out the main questionnaire study to test the wording and organisation of items on the form. The pilot study targeted twenty-five randomly selected team members working at the research department at Arab Academy for Science and Technology and Maritime Transport in Alexandria, Egypt. The questionnaires were distributed by hand to each participant in the pilot study with an immediate reply. As a result of the pilot study, no problems were found with the words or the arrangements of the sections, except that some participants did not like to answer the social desirability part. One participant argued that "it is not related to our work in the team... what exactly you are aiming to achieve from this part?" Therefore, it was decided to run the main questionnaire with a statement to explain the purpose of using the SDS in the questionnaire (see Appendix F for the second version of the Arabic questionnaire that was used in Study Two, also the English questionnaire for the managers' evaluation).

7.4 The Research Site: Mantrac Co.

7.4.1 History of Mantrac

Mantrac was found in 1977 as the Egyptian manufacturing company that has successfully served Egypt and the Middle East with an extensive caterpillar product line. Mantrac is one of the world's top-heavy equipment manufacturing companies. For over two decades Mantrac has been providing Egypt with the world's best heavy equipment, complemented by "superlative customer services" (Mantrac Annual Report, 1999-2000). Mantrac offers the full line of caterpillar construction machinery, power systems and material handling equipment, in addition to the full line of Michelin tyres and other agricultural equipment.

Mantrac invested millions of dollars on over 85,000 square meters at the main facility in El-Amerya-Alexandria, coupled with the creation of a number of branches through Egypt. Mantrac used extensive high technology, computerised information and automated inventory systems.

The company argues that it gives great emphasis to human resources, which it considers as one of the main sources that brings to the company a wealth of skills, enthusiasm and creativity. Employees throughout the organisation are trained locally and overseas in a variety of quality improvement techniques and Mantrac feels that this helps them to continue to set new standards. Teamwork is the philosophy that Mantrac used and implemented in different departments in the organisation to improve work effectiveness (Mantrac Annual Report, 1999-2000).

7.4.2 Teamwork at Mantrac

Teams are found in many different departments at Mantrac Company. This current study focused on different teams at five service departments; customer service department, sales and marketing department finance department, human resource management department and business administration department. An interview was conducted with a manager of Mantrac (from the top management level) to explain the aim of the study. Through the interview, the researcher focused on the importance of collecting the data from all team members in each chosen team. Therefore, the Mantrac manager suggested that the questionnaires that the researcher planned to use in this study could be distributed mainly into the customer service department that consists of 600 employees. Also, the questionnaires could be distributed into other departments such as sales and marketing department, finance department, human resource and administrative department. The researcher thought that this would facilitate building up a complete picture of the teamwork from different departments at Mantrac Company. The researcher also met the

manager of each department to discuss the way of distributing the questionnaires to all team members in their departments. The number of teams and the number of team members in each team were found out through managers' interviews. After these interviews, the chosen sample taking part of this study was composed of 600 team members working at five different departments that were working at 19 units that divided the work among 86 different teams. Table 7.1 describes the teams in each department at Mantrac Company.

Department	Unit	Number of teams	Number of team members
1.Customer Service	1. Commercial Services	4	15
	2. Service Shops	4	14
	3. Used and rent	8	37
	4. Maintenance	20	87
	5. Management information technology	4	19
	6. Stores	4	24
	7. Branches parts	10	56
	8. Preparations	5	22
2. Sales and Marketing	9. Sales	4	17
	10. Marketing	2	12
	11. Sales Office	2	9
	12. Services Sales	1	6
3. Finance	13. Accounting	5	22
	14. Auditing	3	14
	15. Credit	2	9
	16. Legal	3	16
4.Human Resources Management	17. Human Resources	2	10
	18. Training	2	8
5. Business Administration	19. Technical Administration	1	5
Totals		**86 teams**	**402**

Table 7.1 The teams in each department at Mantrac company.

7.5 Data Collection

7.5.1 Distribution and collection of the questionnaires

The revised questionnaire was distributed to the chosen sample at their work site by the researcher by giving the questionnaires to the manager of each unit in each department. The permission was given to the researcher only to distribute the questionnaires and collect

them back. The researcher suggested that all team members could return the completed questionnaires back into a large box that was designed specially for that purpose. This used to help all team members feel free to fill in the questionnaires, especially since there is no need to write their names on the questionnaires. Then the researcher collected all completed questionnaires from the box.

The questionnaires were distributed between February 2000 and May 2000. No time limit was specified for completion of the questionnaires. The researcher put a number for each department, each unit and each team (as mentioned in Table 7.1) on the questionnaires before distributing them. For example: department / unit / team number (1/2/4) means team number four in the second unit in the first department. The researcher distributed 600 questionnaires into Mantrac different departments. 402 completed and usable questionnaires were returned into the box. The response rate was approximately 67 per cent. Then, the researcher added another number to each questionnaire on the right corner to identify the respondents from each team. This gave altogether four numbers written on each questionnaire. For example: department / unit / team number / respondent (1 / 2 / 4 / 5) means the respondent number five in the fourth team in the second unit in the first department. The aim of using the serial number is to facilitate easy grouping of the completed questionnaires together.

7.5.2 Coding and analysis of the questionnaires

Responses were coded and entered into SPSS (the Statistical Package for Social Science Version 9.0). Using the same coding that was used in Study One. The new part that focused on social desirability was coded with the dichotomously scored response, true (1) and false (2). The same procedures were used to re-code the variables that were reversed scored in their original scale before run any statistical analysis. The analysis was made in two stages; individual level and group level of analysis (as explained later in this chapter).

7.6 Results

The results will be considered in three sections: (1) characteristics of sample; (2) individual level of analysis and; (3) group level of analysis.

7.6.1 Sample characteristics

Table 7.2 shows the characteristics of the sample in terms of gender, education level, departments and units. Table 7.3 shows the means, standard deviations and range by years in terms of years in job, experience and team experience.

Category	Frequency	Per Cent
Gender:		
Male	374	93
Female	28	7
Education level:		
High school degree	168	41.8
College degree	228	56.7
Post graduate degree	6	1.5
Department:		
Customer service	274	68.2
Sales and Marketing	44	10.9
Finance	61	15.2
Human Resources	18	4.5
Business Administration	5	1.2
Units:		
Commercial services	15	3.7
Service shop	14	3.5
Used and Rent	37	9.2
Maintenance	87	21.6
MIS	19	4.7
Stores	24	6.0
Branches parts	56	13.9
Preparation	22	5.5
Sales	17	4.3
Marketing	12	3.0
Sales office	9	2.2
Service sales	6	1.5
Accounting	22	5.5
Auditing	14	3.5
Credit	9	2.2
Legal	16	4.0
Human resources	10	2.5
Training	8	2.0
Technical Administrative	5	1.2

Table 7.2 Sample characteristics

Category	M	SD	Range (years)
Years in job	7.86	5.14	From 1 to 30 years
Team experience (years)	4.58	2.55	Up to 15 years

Table 7.3 Sample characteristics in terms of team and job experience

It may be seen from the tables that the majority of the team members are male, while there were a small percentage of female workers but only in administrative work. More then 50 per cent had a college degree. There was also a variety of experiences amongst the team members in all departments.

7.6.2 Individual level of analysis

The analysis of the individual level with all team members in the chosen sample was conducted as follows:

7.6.2.1 Descriptive statistics and scale reliability

Descriptive statistics

The descriptive statistics (means and standard deviations) for the scale were computed and are shown in Tale 7.4.

Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Contributor	4.20	0.35	--																
2. Collaborator	4.16	0.35	.66**	--															
3. Communicator	4.14	0.41	.70**	.72**	---														
4. Challenger	4.20	0.37	.69**	.66**	.66**	--													
5. Team Performance	3.13	0.97	-.14**	-.18**	-.13*	-.17**	--												
6. Team Efficacy	4.02	0.66	.13**	.27**	.23**	.25**	-.21**	--											
7. W. Method Autonomy	4.04	0.77	.21**	.22**	.28**	.20**	-.13*	.32**	--										
8. W. Schedule Autonomy	3.88	0.85	.09	.13**	.15**	.10	-.21**	.29**	.52**	--									
9. W. Criteria Autonomy	3.95	0.80	.23**	.32**	.39**	.31**	-.29**	.34**	.52**	.53**	--								
10. Team Vision	3.93	0.59	.11*	.18**	.14**	.11*	.02	.24**	.20**	.26**	.16**	--							
11. Team Heterogeneity	4.11	0.60	.32**	.35**	.37**	.36**	-.28**	.29**	.20**	.17**	.38**	.19**	--						
12. Team Potency	4.13	0.74	.15**	.26**	.23**	.15**	-.16**	.18**	.14**	.18**	.13**	.28**	.35**	--					
13. Managerial Support	4.10	0.83	.19**	.26**	.27**	.16**	-.13*	.06	.18**	.11*	.10*	.26**	.17**	.47**	--				
14. Team Leader Directing	4.13	0.68	.25**	.23**	.29**	.29**	-.11*	.20**	.17**	.05	.14**	.20**	.16**	.27**	.28**	--			
15. Team Leader Coaching	4.17	0.66	.30**	.27**	.33**	.32**	-.19**	.38**	.33**	.32**	.31**	.36**	.37**	.43**	.36**	.49**	--		
16. Team Psycho. Safety	3.25	0.53	-.07	-.04	.10*	.04	.26**	.08	.13*	-.04	-.06	.02	-.17**	.13**	.02	.21**	.19**	--	
17. Relative Team Size	3.62	1.18	.17**	.27**	.27**	.29**	-.34**	.21**	.17**	.11*	.38**	.05	.31**	-07	.02	.06	.16**	-.09	--
18. SDS	1.73	0.18	.24**	.08	.28**	.20**	.14**	-.10	.07	-.08	.07	.09	-.02	-.04	.10*	.16**	.19**	.14**	-.05

Table 7.4 Descriptive Statistics (means and standard deviations) and inter-correlations. Zeros are omitted from correlations.
Note: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

Scale reliability

The reliability of a scale is a fundamental issue in psychological measurement as mentioned previously in Study One (Iron and Steel Co.). In the current study, internal consistency was calculated because: (i) there is a need to test the extent of the homogeneity of the items in the scale used, especially with the social desirability items; (ii) because of the difficulty of collecting data twice from the team members in Mantrac, therefore, it was difficult to assess the test-retest reliability of the scale. The internal reliability of the scale Cronbach α was calculated. Table 7.5 shows Cronbach α for each of the scales in previous studies and in Study One compared with the calculated Cronbach α in the current study.

Scale	Previous studies	Study One	Current study
Team player style:			
Contributor	0.51 (Students), 0.59 (Business)	0.39	0.53
Collaborator	0.20 (Students), 0.26 (Business)	0.39	0.45
Communicator	0.65 (Students), 0.55 (Business)	0.52	0.62
Challenger	0.47 (Students), 0.38 (Business) (Kirnan and Woodruff, 1994)	0.52	0.56
Autonomy:			
Work method autonomy	0.91- 0.92	0.80	0.78
Work schedule autonomy	0.81	0.45	0.72
Work criteria autonomy	0.77- 0.83 (Breaugh, 1985)	0.71	0.68
Team performance	0.76 (Hackman, 1990)	0.61	0.87
Team vision	0.84 to 0.86 (Kivimaki *et al.* ,1997)	0.85	0.77
Team heterogeneity	0.74 (Campion, Medsker and Higgs, 1993)	0.48	0.45
Team beliefs:			
Team spirit (potency)	0.80 (Campion *et al.*,1993)	0.77	0.76
Team efficacy	0.63 (Edmondson, 1998)	0.49	0.41
Team managerial support	0.74 (Campion *et al.*, 1993)	0.60	0.80
Team leader behaviour:			
Directing	0.84	0.76	0.63
Coaching	0.80 (Hackman 1990)	0.70	0.74
Team psychological safety	0.82 (Edmondson, 1998)	0.56	0.40
Social desirability	From 0.73 to 0.88 (Crowne and Marlowe, 1960; Vella-Brodrick and White , 1997)		0.40

Table 7.5 Cronbach α for each of the scale in the previous studies, Study One and the calculated Cronbach α in the current study.

Table 7.5 presents Cronbach α for the scales. The Cronbach α for team player styles from previous research (Kirnan and Woodruff, 1994) ranged from 0.20 to 0.65 in the students' sample and from 0.26 to 0.59 in the business sample with no statistically differences between the two samples. This indicated low internal consistency for team player styles, especially for the collaborator and challenger scales. The Cronbach α for team player styles from Study One ranged from 0.39 to 0.52. This indicated low internal consistency for PTPS particularly for the contributor in Study One compared with Kirnan and

Woodruff (1994) (0.39 compared with 0.51 and 0.59 respectively). While for the collaborator and challenger styles, higher Cronbach α were found in Study One compared with the previous studies (0.39 compared with 0.20 and 0.26 respectively). A Cronbach α for the communicator was found similar compared with the previous studies (0.52 and 0.55 respectively).

In the current study, higher Cronbach α's were found for the PTPS scale compared with Study One. For the contributor, collaborator, communicator and challenger styles (0.53, 0.45, 0.62 and 0.56 compared with 0.39, 0.39, 0.52 and 0.52 respectively). On the other hand, high Cronbach α were found for the PTPS scales in the current study compared with previous studies (Kirnan and Woodruff, 1994) for the collaborator, communicator and challenger styles (0.45, 0.62 and 0.56 compared with 0.20 - 0.26, 0.65 - 0.55 and 0.38 - 0.47 respectively), and a similar Cronbach α was found for the contributor style in the current study compared with the previous studies (0.53 compared with 0.51 and 0.59 respectively). It can be concluded that Cronbach α for PTPS in Mantrac Co. revealed a higher internal consistency for the four team player styles compared with both Study One and with the previous studies by Kirnan and Woodruff (1994). Clearly however the Parker scales require further refinement (this is beyond the aims of the present research).

The Cronbach α for the autonomy scale from previous research ranged from 0.77 to 0.92 (Breaugh, 1985). Acceptable levels of Cronbach α for the autonomy scale were found from Study One for work method autonomy and work criteria autonomy compared with Breaugh (1985) (0.80 and 0.71 compared with the range of 0.91- 0.92 and 0.77- 0.83 respectively). Low Cronbach α for the work schedule autonomy was found from Study One compared with Breaugh (1985) (0.45 and 0.81 respectively). High Cronbach α was found for work schedule autonomy in the current study (Mantrac) compared with Study One (0.72 compared with 0.81 and 0.45 respectively). Which is considered as an

acceptable level. The Cronbach α of work method autonomy and work criteria autonomy in the current study were (0.78 and 0.68) compared with (0.80 and 0.71) in Study One and compared with a range of 0.91-0.92 and 0.77-0.83 in previous work respectively. It can be concluded that Cronbach α for the autonomy scale in the current study revealed an acceptable level of internal consistency as found in the previous work. Two of the autonomy scales were above 0.70, which is considered as acceptable in social research (Kline, 1993). While only one item is 0.68, which is above 0.60 that is considered as reasonable in organisational research in practice as suggested by Finkelstein (1992). This indicated that the Cronbach α for the autonomy scale in Mantarc Co., considered acceptable for research use.

High Cronbach α for team performance and team managerial support were found in the current study compared with the previous studies and compared with Study One (0.87, 0.76 and 0.61 for team performance and 0.80, 0.74 and 0.60 for team managerial support respectively). This indicated that the Cronbach α for the team performance and team managerial support scales have higher internal reliability in the form used here compared with the internal reliability in their original versions and previously cited research.

Similar Cronbach α were found for team vision and team potency scales in the current study compared with previous studies and with Study One (0.77, 0.86 and 0.85 for team vision respectively and 0.76, 0.80 and 0.77 for team potency respectively). This indicated that the Cronbach α for the team vision and team potency scales have adequate internal reliability in their original versions and in the form used here. The scales are all above 0.70, which are considered as an acceptable in social research (Kline, 1993).

High Cronbach α was found for team leader behaviour (coaching) in the current study compared with Study One (0.74 and 0.70 respectively) and low compared with the

previous study (Hackman, 1990) (0.74 and 0.80 respectively). The Cronbach α for team leader behaviour (coaching) is still acceptable because it is above 0.70 as suggested by Kline (1993).

On the other hand, some other differences were found between previous studies and Study One compared with the current study for some scales such as: team efficacy, team heterogeneity, team leader behaviour (directing) and team psychological safety. Low Cronbach α for team efficacy, team heterogeneity, team leader behaviour (directing) and team psychological safety were found in the current study compared with previous studies and compared with Study One (0.41, 0.63 and 0.49 respectively for team efficacy); (0.45, 0.74 and 0.48 respectively for team heterogeneity); (0.63, 0.84 and 0.76 respectively for team leader behaviour in directing) and (0.40, 0.82 and 0.56 respectively for team psychological safety). The Cronbach α for team leader behaviour in directing was above 0.60 (Finkelstein, 1992), while the Cronbach α for the other scales such as team efficacy, team heterogeneity and team psychological safety were under 0.50, but they were similar to the Cronbach α that were found from Iron and Steel Co., (0.41 and 0.49) for team efficacy; (0.45 and 0.48) for team heterogeneity; and (0.40 and 0.56) for team psychological safety respectively in the current study compared with Study One.

Cronbach α for the social desirability scale was computed in the current study. Low internal reliability was found compared with previous studies. In previous research the Marlowe-Crowne Social Desirability Scale (SDS) had an acceptable internal consistency with Cronbach α ranging from 0.73 to 0.88, and test-retest coefficient was 0.89 (Crowne and Marlowe, 1960 and Vella-Brodrick and White, 1997).

In general it can be concluded that the Cronbach α for PTPS, team performance, team managerial support were higher than in previous work. Also the Cronbach α for team

autonomy, team vision, team potency, team leader behaviour in coaching and directing have adequate internal reliabilities as the original versions. While, low internal reliabilities were found for team efficacy, team heterogeneity and team psychological safety compared with previous studies but seems to be similar to the internal reliabilities that found in Study One. In the current study SDS was calculated for the first time (it was not calculated in Study One). It showed low internal consistency compared with previous studies (this may be because of issues in the translation of the scale, factors related to the Egyptian culture, etc; see conclusion for further discussion). It seems that the internal reliabilities for the scales used in the current study (Mantrac) are higher than the internal reliabilities used in Iron and Steel Co. (Study One).

7.6.2.2 Scale inter-correlations

Table 7.4 shows the Pearson Product Moment (PPM) correlation coefficient between each of the variables. The correlation coefficient (r) may range between –1 and +1 and measures the strength of the linear relationship between the variables. The inter-correlation for PTPS scale indicated that the four team player styles are positively related to each other ($p < 0.01$). The four PTPS scales are also statistically and significantly related with other variables in the scale. The contributor style is positively related to self-rated team belief (team efficacy and team potency), work method autonomy, work criteria autonomy, team heterogeneity, team managerial support, team leader behaviour (directing and coaching) and relative team size ($p < 0.01$), and is also positively related to team vision ($p < 0.05$). There is a negative correlation between contributor style and self-rated team performance ($p < 0.01$).

The collaborator style is positively related to self-rated team belief (team efficacy and team potency), work method autonomy, work schedule autonomy, work criteria autonomy, team vision, team heterogeneity, team managerial support, team leader behaviours (directing and

coaching) and relative team size ($p < 0.01$). There is negative correlation between collaborator style and self-rated team performance ($p < 0.01$). The communicator style is positively related to self-rated team beliefs (team efficacy and team potency), work method autonomy, work schedule autonomy, work criteria autonomy, team vision, team heterogeneity, team managerial support, team leader behaviours (directing and coaching) and relative team size ($p < 0.01$) and is positively related to team psychological safety ($p < 0.05$). There is a negative correlation between communicator style and self-rated team performance ($p < 0.05$). The challenger style is positively related to self-rated team belief (team efficacy and team potency), work method autonomy, work criteria autonomy, team heterogeneity, team managerial support, team leader behaviours (directing and coaching) and relative team size ($p < 0.01$) and is positively related to team vision ($p < 0.05$). There is a negative correlation between challenger style and self-rated team performance ($p < 0.01$).

Correlations for self-rated team performance show that only one positive relationship with team psychological safety was found ($p < 0.01$). There are some negative correlations between self-rated team performance and self-rated team belief (team efficacy and team potency), work schedule autonomy, work criteria autonomy, team heterogeneity, team leader behaviour in coaching and relative team size ($p < 0.01$). There are negative correlations as well between self-rated team performance and work method autonomy, team managerial support and team leader behaviour in directing ($p < 0.05$).

Self-rated team belief (team efficacy) is positively related to work method autonomy, work schedule autonomy, work criteria autonomy, team vision, team heterogeneity, self-rated team belief (team potency), team leader behaviours (directing and coaching) and relative team size ($p < 0.01$). Statistically significant inter-relationships exist between the three autonomy scales (work method autonomy, work schedule autonomy and work criteria

autonomy), which means that the autonomy scales are positively and statistically significant related to each other. Work method autonomy is positively related to team vision, team heterogeneity, self-rated team belief (team potency), team managerial support, team leader behaviours (directing and coaching) and relative team size ($p < 0.01$) and is positively related to team psychological safety ($p < 0.05$). Work schedule autonomy is positively related to team vision, team heterogeneity, self-rated team belief (team potency) and team leader behaviour (coaching) ($p < 0.01$) and is positively related to team managerial support and relative team size ($p < 0.05$). Work criteria autonomy is positively related to team vision, team heterogeneity, self-rated team belief (team potency), team leader behaviours (directing and coaching) and relative team size ($p < 0.01$) and is positively related to team managerial support ($p < 0.05$).

Team vision is positively related to team heterogeneity, self-rated team belief (team potency), team managerial support and team leader behaviours (directing and coaching) ($p < 0.01$). Team heterogeneity is positively related to self-rated team belief (team potency), team managerial support, team leader behaviour (directing and coaching) and relative team size ($p < 0.01$) and negatively related with team psychological safety ($p < 0.01$). Self-rated team belief (team potency) is positively related to team managerial support, team leader behaviours (directing and coaching) and team psychological safety ($p < 0.01$). Team managerial support is positively related to team leader behaviours (directing and coaching) ($p < 0.01$). Team leader behaviour items are positively related to each other (directing and coaching) ($p < 0.01$). Team leader behaviour (coaching) is positively related to relative team size ($p < 0.01$). The SDS scale used in the current study measures the social desirability by using the short form X1 developed by Strahan and Gerbasi (1972). This provided a good approximation of the original SDS by Crowne and Marlowe (1960). There are some positive correlations between the SDS items and contributor style, communicator style, challenger style, self-rated team performance, team leader behaviour in directing,

team leader behaviour in coaching and team psychological safety ($p < 0.01$) and with team managerial support ($p < 0.05$). These correlations were low, which ranged from 0.10 to 0.28.

Clearly, there are some statistically significant inter-correlations between the variables in the scale used in the current study. It was decided to conduct a factor analysis to explore these inter-correlations further (see below).

7.6.2.3 Factor analysis

Exploratory factor analysis is used in the current study to simplify a large set of data, and to identify the most important variables (Kline, 1993) and to discover the structure in the variables used (Child, 1995). This is the same type of analysis that was used in Iron and Steel Co. (Study One).

Exploratory factor analysis

Exploratory factor analysis (EFA) was used in the current study to assess the inter-relationships of the selected variables (the same type of analysis was used in Study One). The factor analysis in the current study may give more reliable findings because the sample size is 402 team members compared with 132 in Study One. Hair, Anderson, Tatham and Black (1995) and Kline (1998) pointed out that the recommended sample size is 100 subjects or more to run an exploratory factor analysis. The larger sample size and the fact that the samples were different may present a different factor structure than that found with Study One (which used a relatively small sample for EFA). The salient factor loading used in the current study was ≥ 0.30 as suggested by Hair *et al.* (1995) who argued that this factor loading is significant for the sample size of 350 or more. The factor analysis was used only with the variables that showed high internal consistencies (Cronbach α). Therefore, team heterogeneity, team efficacy and team psychological safety with low

internal consistency (0.45, 0.41 and 0.40 respectively) were not included in the factor analysis on subsequent analyses due to the relatively large amount of error variance in these scales (see Chapter Eight for details). To ensure the appropriate use of factor analysis, two tests were conducted to assess the overall significance of the correlation matrix; the Bartlett Test of Sphericity and the Kaiser-Meyer-Olkin KMO measure of sampling adequacy. As examined in Study One, the Bartlett Test of Sphericity is the statistical test for the presence of correlation among variables. KMO measure of sampling adequacy is a measure to quantify the degree of intercorrelations among variables, which is ranging from zero to one. Hair *et al.* (1995) argued 0.50 is an acceptable level of KMO that could be used as a guide to whether or not to proceed the factor analysis. The researcher chose principal components analysis (PCA) as a method of extracting the factors (as explained in detail in Study One). The latent root or eignvalue criterion and the scree plot were used in the current study as criteria for the numbers of factors to be extracted (Cattell, 1965; Hair *et al.*, 1995 and Child, 1995).

In the current study, the principal components analysis was carried out as described in Study One. The KMO measure of sampling adequacy was 0.83. The Bartlett Test of Sphericity was statistically significant ($p < 0.001$) which showed that it is acceptable to proceed with the factor analysis. The number of factors to be extracted according to the latent root or eigenvalue greater than 1.0 criterion suggested three factors and these accounted for 59.56 per cent of the variance (see Table 7.6). The scree plot, which is shown in Figure 7.1 suggested that four factors should be extracted. These four factors accounted for 68.99 per cent of the variance. Therefore, four factors were extracted as suggested by the scree plot criterion (since Kline argued that the scree plot test is the best method although it is subjective to some extent). Varamix method of rotation was used (as explained in Study One) to give a clear separation of the factors.

Scale	Unrotated component				Rotated component			
	1	2	3	4	1	2	3	4
Team player styles:								
Contributor	.73	-.44	-.03	-.21	.87	.05	.12	-.01
Collaborator	.67	-.38	-.08	-.15	.85	.13	.14	.06
Communicator	.80	-.33	-.07	-.12	.85	.16	.18	.11
Challenger	.75	-.41	-.09	-.01	.83	.06	.15	.20
Autonomy:								
Work method autonomy	.53	.53	-.21	-.18	.15	.76	.17	.04
Work schedule autonomy	.42	.68	-.24	-.25	.01	.86	.11	-.03
Work criteria autonomy	.61	.42	-.43	.08	.25	.73	.05	.38
Vision	.36	.39	.39	-.08	.01	.30	.56	-.15
Managerial support	.41	.11	.55	-.08	.19	.06	.64	-.20
Leader coaching	.62	.30	.41	.22	.17	.27	.75	.18
Leader directing	.47	.01	.54	.37	.17	-.10	.75	.22
Relative team size	.40	.01	-.44	.70	.18	.14	-.01	.89
Eigenvalue	4.24	1.76	1.40	.88				
% variance	25.74	17.43	16.39	9.43				

Table 7.6 Shows the rotated and unrotated factor matrix (loadings ≥ 0.30 underlined).

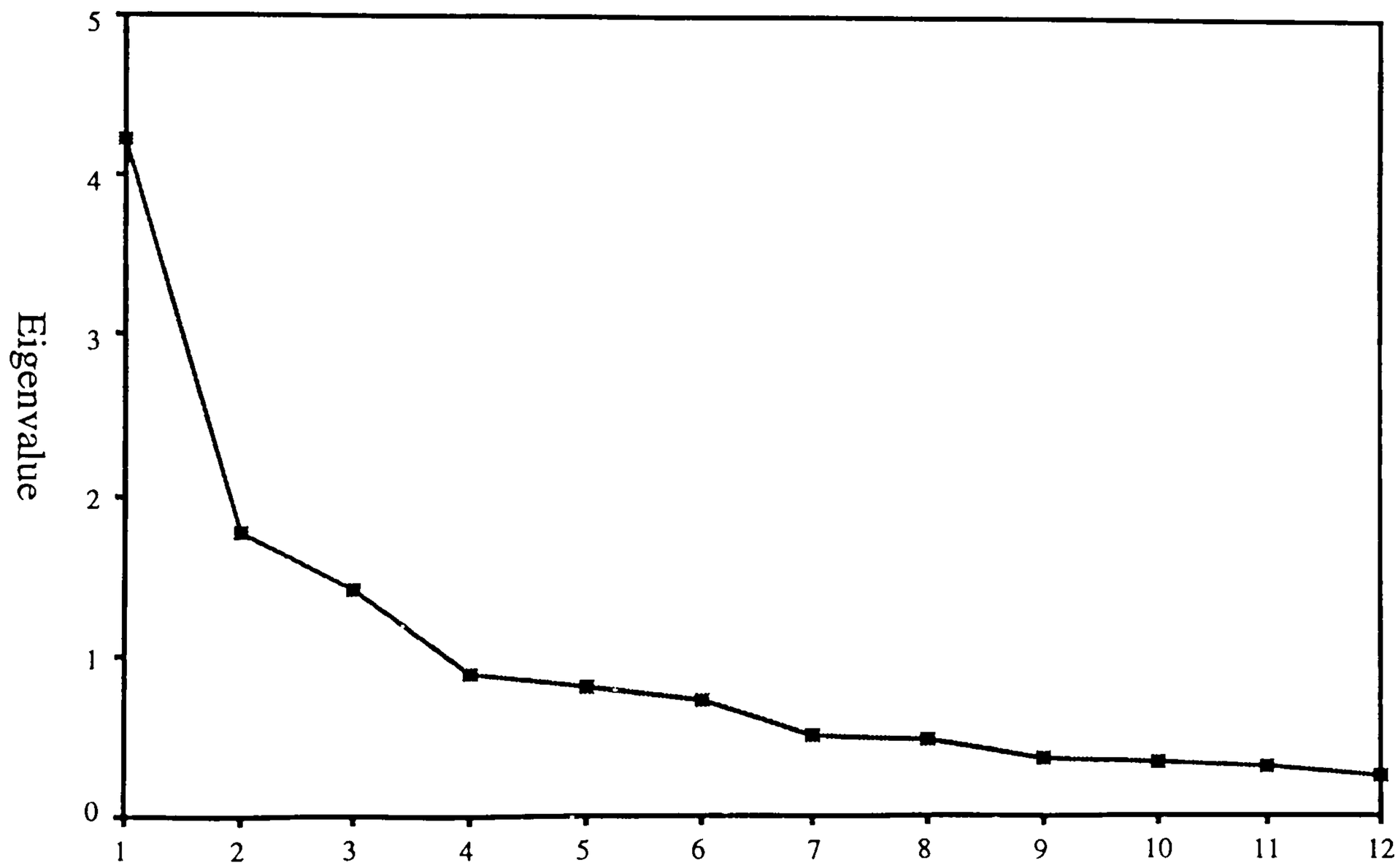


Figure 7.1 The scree plot test.

There are four scales that loaded on Factor 1, (all with factor loading over 0.80). There is a clear association between variables within this factor, these items are team player styles

(contributor, collaborator, communicator and challenger). Therefore, the label for this factor is 'team player styles'. Factor 2 comprises three scales that are concerned with the aspects of team autonomy and all the scales loaded over 0.70. Team vision cross-loaded on Factor 2 and 3 with factor loadings of 0.30 and 0.56 respectively. Team vision will be grouped with Factor 3 because of the high loading on Factor 3 and the low marginal loading on Factor 2. Also work criteria autonomy was cross-loaded on factor 2 and Factor 4 with factor loading of 0.73 and 0.38 respectively. Therefore, it will be grouped with Factor 2 because of the high loading on Factor 2 and for conceptual reason to group the autonomy scale together. Therefore, factor 2 consists of the three facets of autonomy and the label for this factor is 'team autonomy'. Factor 3 comprises four scales that are concerned with team vision, team managerial support and team leader directing and coaching with factor loadings of over 0.70 for team leader behaviour, and it was labelled 'team structure'. Two measures (team size and work criteria autonomy) loaded on Factor 4 at factor loadings of 0.89 and 0.38. The work criteria autonomy was loaded on Factor 2, therefore factor 4 is consisted only of the relative team size and the label for this factor is 'relative team size'.

As a result of the individual level of analysis, it can be concluded that there are some significant relationships between the variables in the proposed model. Also, based on the Factor analysis results, these variables are grouped into four main factors. The following section will focus on the relationships between these factors at the group level of analysis (see below).

7.6.3 Group level of analysis

The analysis at the group level with all teams in the chosen sample was conducted as follows:

7.6.3.1 Descriptive statistics

The descriptive statistics (means and standard deviations) for the teams and inter-correlations at the group level of analysis were computed as shown in Table 7.7.

7.6.3.2 Inter-correlations

Table 7.7 shows the Pearson Product Moment (PPM) correlation coefficient between each of the variables at the group level of analysis. The inter-correlation for PTPS scale at the group level of analysis indicated that the contributor style was positively related to collaborator, communicator and challenger styles ($p < 0.01$), the collaborator style was positively related to the communicator and the challenger ($p < 0.01$) the communicator style was positively related to challenger style ($p < 0.01$). The four team player styles were positively related to each other. There were some correlations found between each team player style and the other variables. The contributor style was positively correlated with team heterogeneity, team leader behaviour in directing ($p < 0.01$), and was positively related to team managerial support and relative team size ($p < 0.05$) and negatively correlated with work schedule autonomy and team psychological safety ($p < 0.05$). There were some statistically significant correlations between the collaborator style and self-rated team belief (team efficacy), work criteria autonomy, team vision, team heterogeneity, team managerial support and team leader coaching ($p < 0.01$), and with work method autonomy, team leader directing and relative team size ($p < 0.05$). The collaborator style was negatively related with self-rated team performance ($p < 0.05$). The communicator style showed some positive correlations with work method autonomy, self-rated team belief (team potency and team efficacy) ($p < 0.05$) and with work criteria autonomy, team vision, team heterogeneity, team managerial support, team leader behaviour in directing, team leader behaviour in coaching and relative team size ($p < 0.01$). While there was a negative correlation between the communicator style and self-rated team performance ($p < 0.01$). Challenger style revealed positive correlations with self-rated team belief (team efficacy),

work criteria autonomy, team heterogeneity, team leader behaviour in directing, team leader behaviour in coaching and relative team size ($p < 0.01$) and also with work method autonomy, team vision and team managerial support ($p < 0.05$). While there was a negative correlation found with the age of the teams' members ($p < 0.05$).

The inter-correlation for self-rated team performance showed that there were some positive correlations with the age of the teams' members and team psychological safety ($p < 0.01$), and with job experience and team experience ($p < 0.05$). While there were other negative correlations found with self-rated team belief (team efficacy $p < 0.05$) and with work criteria autonomy, team heterogeneity, team managerial support and relative team size ($p < 0.01$). Self-rated team belief (team efficacy) was positively related to work method autonomy, work schedule autonomy, work criteria autonomy, team vision, team heterogeneity, team leader behaviour in directing, team leader behaviour in coaching and relative team size ($p < 0.01$). There were some negative correlations found with self-rated team belief (team efficacy) and team age, job experience and team experience ($p < 0.01$).

Work method autonomy was positively related with work schedule autonomy, work criteria autonomy, team heterogeneity, team leader behaviour in directing ($p < 0.01$) and with relative team size ($p < 0.05$). Work schedule autonomy was positively related with work criteria autonomy, team vision, self-rated team belief (team potency) and team leader behaviour in directing ($p < 0.01$). Work criteria autonomy was positively related to team vision, team heterogeneity, team leader behaviour in directing and relative team size ($p < 0.01$) and to team leader behaviour in coaching ($p < 0.05$). Work criteria was negatively related to team psychological safety ($p < 0.05$) and to team age, job experience and team experience ($p < 0.01$).

Team vision was positively related to team heterogeneity, self-rated team belief (team potency), team managerial support, team leader behaviour in directing, team leader behaviour in coaching and relative team size ($p < 0.01$). Team heterogeneity was positively correlated with team managerial support ($p < 0.05$) and with team leader behaviour in directing and relative team size ($p < 0.01$). While there were negative correlations found between team heterogeneity and team psychological safety and team age ($p < 0.05$). Self-rated team belief (team potency) was positively correlated with team managerial support, team leader behaviour in directing and team leader behaviour in coaching ($p < 0.01$). Team managerial support was positively related to team leader behaviour in directing, team leader behaviour in coaching and relative team size ($p < 0.01$) and negatively related to team psychological safety ($p < 0.05$). Team leader behaviour in directing was positively related to team leader behaviour in coaching and relative team size ($p < 0.01$) and to team psychological safety ($p < 0.05$). Team leader behaviour in coaching was positively correlated with team psychological safety ($p < 0.05$) and negatively correlated with job experience and team experience ($p < 0.01$). Team psychological safety was positively related to team age and job experience ($p < 0.01$). Relative team size was negatively related to team age, job experience and team experience ($p < 0.01$). While team age was correlated with job experience and team experience ($p < 0.01$). Job experience was positively related to team experience ($p < 0.01$). There was a negative relationship between managers' rated team performance and managers' rated team belief (team efficacy) ($p < 0.01$).

Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1.Contributor	4.20	.15	--																				
2.Collaborator	4.16	.17	.50**	--																			
3.Communicator	4.14	.16	.53**	.58**	--																		
4. Challenger	4.19	.15	.55 **	.59**	.68**	--																	
5.Self- rated team Performance	3.13	.53	.06	-.25*	-.27**	-.18	--																
6. Self-rated team Efficacy	4.01	.41	.06	.34**	.24*	.39 **	-.21*	--															
7.Work Method autonomy	4.04	.37	.12	.22*	.23*	.21*	.07	.32**	--														
8.Work Schedule Autonomy	3.87	.40	-.23*	.12	.01	.03	-.08	.43 **	.31 **	--													
9.Work Criteria Autonomy	3.39	.42	.02	.28**	.34**	.36**	-.34**	.47 **	.47 **	.54**	--												
10. Team Vision	3.92	.33	.12	.28**	.33 **	.23 *	-.09	.37 **	.12	.40 **	.31 **	--											
11. Team Heterogeneity	4.11	.27	.26**	.38**	.45 **	.46**	-.25**	.37**	.31 **	.14	.43 **	.31 **	--										
12. Team Potency	4.12	.31	-.02	.17	.19*	.10	-.02	.17	.03	.41 **	.12	.33 **	.16	--									
13. Managerial Support	4.09	.38	.24*	.32**	.44 **	.24*	-.26**	.01	.03	-.09	.09	.35 **	.19*	.34 **	--								
14.Team Leader directing	4.16	.34	.32**	.22*	.51 **	.58 **	-.11	.44 **	.30 **	.30**	.38 **	.44 **	.47 **	.39 **	.36 **	--							
15. Team Leader Coaching	4.12	.34	.07	.35**	.40 **	.39**	-.12	.26 **	-.02	.12	.18 *	.31**	.13	.29 **	.32**	.59 **	--						
16. Team Psychological Safety	3.25	.29	-.19*	-.21	.01	.16	.31 **	-.02	.01	-.02	-.24*	-.08	-.19*	.12	-.18*	.21*	.25*	--					
17.Relative team Size	3.61	.70	.22*	.25*	.42 **	.52 **	-.42**	.44 **	.18*	.06	.46 **	.37**	.50 **	-01	.28**	.34**	.13	-.11	--				
18.Age	32.15	4.08	.09	.09	.12	-.18*	.39**	-.44**	.00	-.14	-.36**	-.09	-.24*	.06	-.01	.03	-.07	.35**	-.38**	--			
19.Job Experience	7.86	2.88	.03	.02	.08	-.12	.20*	-.33**	-.04	-.06	-.25**	-.10	-.12	.05	-.02	-.02	-.27**	.25**	-.31**	.75**	--		
20.Team Experience	4.61	1.42	.02	-.05	-.07	-.13	.22*	-.26**	-.08	-.14	-.34**	-.05	-.06	.02	-.04	-.05	-.29**	.07	-.26**	.53**	.67**	--	
21.Manger-rated team performance	2.18	.46	-.01	.13	-.04	-.08	-.08	-.02	-.04	-.01	-.14	.01	-.17	.08	.21*	.03	.04	-.02	-.10	.12	.15	-.01	--
22. Manger-rated team efficacy	4.02	.51	-.06	-.09	-.06	.02	.01	-.01	-.06	-.05	.04	-.05	-.03	-.05	-.12	-.07	-.05	.08	.09	-.16	-.11	-.09	-.34**	--

Table 7.7 Descriptive statistics and inter-correlations at group level of analysis. * $p < 0.05$, ** $p < 0.01$.

The internal consistencies (Cronbach α) of the managers' rating of team performance and the managers' rating of team beliefs (team efficacy) were calculated. Table 7.8 shows Cronbach α for each of the scales in the current study.

Scale	Reliability Cronbach α
Managers' rating of team performance	0.63
Managers' rating of team beliefs (team efficacy)	0.57

Table 7.8 Cronbach α for the managers' rating scales.

7.6.3.3 Team balance

As explained earlier in Study One, team balance is an important issue in team behaviour models. To measure the team balance in the current study two measures were considered; team balance from the team player styles' average and team balance mix as explained in Study One.

A) Team balance (average)

Senior (1997) argued that balanced team occurs when the team's average scores on each team role are found to be similar. She argued that the average team role scores might present team role characteristics, which may suggest a degree of balance. In the current study the same idea will be used by computing the means of team player styles for each team and then the overall team player style mean for every team was computed.

The overall TPS mean (M) = (Contributor + Collaborator + Communicator + Challenger) / 4

B) Team balance mix

Parker argued that the balanced teams must encompass of the four team player styles. As explained in Study One in the original ipsative long version of PTPS the balanced team should equal a total of 180 for all team player styles. In the current study because the use of a normative short version of PTPS that consists of 10 statements with a total of 40 items. I would argue to compute the score for team balanced as in Study One. By following the same idea presented by Parker, the balanced team that consists of the four team player styles should on average equal a total of 4 in the current study and any team that got less than 4 (3, 2 or 1) should considered as a non-balanced team.

A balanced team was computed here by re-coding the four team player styles means into new variables as shown in Appendix G. For example: in team number one, if the average team style ranged between 4 and 5, it transferred into 1 and if the average is less than 4 (3, 2 or 1) this will transfer into zero. Then a total of the four new variables of the four -team player styles were computed:

Total score of team player styles = Contributor + Collaborator + Communicator + Challenger

As explained in Study One, the total score of team player styles should equal 4 to have balanced team. A total score of three or less means the team is non-balanced (that is lacks one or more of the styles). Then a new variable was computed to identify the balanced and non-balanced teams. Only teams with a total score of team player styles of 4 is considered balanced. Team balance average will be used in the correlation and in the regression analysis, while the team balance mix will be used in the team comparison in the *t*-test (as explain below).

Table 7.9 shows the Pearson Product Moment (PPM) correlation coefficient between team player styles (means M) and team autonomy, team structure, relative team size, self-rated team belief, self-rated team performance, managers' rating of team belief and managers' rating of team performance. There is a positive relationship found between the team player styles (M) and team autonomy ($p < 0.05$) and there is a negative correlation found between team player styles (M) and self-rated team performance ($p < 0.05$). There are positive relationships found between team player styles (M) and team structure and relative team size ($p < 0.01$). Team autonomy is positively related to team structure and self-rated team beliefs ($p < 0.05$) and with relative team size ($p < 0.01$). Team structure is positively related to relative team size and self-rated team beliefs ($p < 0.01$). There is a negative relationship found between relative team size and self-rated team performance ($p < 0.01$). There is a negative relationship found between managers' rated team performance and managers' rated team beliefs ($p < 0 .01$).

Items	1	2	3	4	5	6	7	8
1.Team player styles (M)	--	.22*	.52**	.42**	.13	-.22*	.01	-.06
2. Team autonomy		------	.30*	.30**	.24*	-.15	-.08	-.02
3. Team structure			--	.38**	.46**	-.20	.10	-.10
4. Relative team size				---	-.01	-.42**	-.10	.09
5. Self-rated team beliefs					------	-.02	.08	-.05
6. Self-rated team performance						------	-.08	.01
7. Managers' rating of team performance							----	-.34**
8. Managers' rating of team beliefs								------

Table 7.9 Pearson Product Moment correlations. Note: *$p < 0.05$, **$p < 0.01$.

Team balanced and non-balanced comparison

To assess the differences in effectiveness between balanced and non-balanced teams *t*-tests were performed. The test compared balanced and non-balanced team effectiveness based on the team balance mix through self-report and managers' report of team performance and through all the variables in the used scales derived from the factor analysis as shown in Table 7.10.

Scale	Balanced teams		Non-balanced teams		$t_{1,85}$	*p*
	M	SD	M	SD		
Team autonomy	4.01	(.31)	3.75	(.27)	3.39	.001
Team structure	4.15	(.22)	3.83	(.24)	5.41	.001
Relative team size	3.75	(.64)	3.18	(.73)	3.41	.001
Self-rated team beliefs	4.16	(.28)	3.98	(.37)	2.39	.005
Self-rated team performance	3.05	(.50)	3.38	(.55)	-2.63	.005
Managers' rating of team performance	2.20	(.47)	2.10	(.43)	.82	.21
Managers' rating of team beliefs	3.98	(.50)	4.16	(.54)	-.14	.08

Table 7.10 Team balanced and non-balanced comparison. *Note:* $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

Table 7.10 shows the *t*-test results for balanced and non-balanced teams (one-tailed test). The direction of the differences that are needed to assess the differences between the means of balanced and non-balanced teams in the current study found to be in the expected direction. Significant differences between means were found on team autonomy, team structure, self-rated team beliefs, relative team size and self-rated team performance between balanced and non-balanced teams. These differences were in the same direction as expected that balanced teams outperform non-balanced teams for all variables except for the self-rated team performance, the non-balanced teams found to report themselves higher than the balanced teams. There is a hint of statistically significant differences between managers' rated team beliefs but it was not in the expected directions, the non-balanced teams were rated better than the balanced teams. This indicated that there appear to be differences between balanced and non-balanced teams, and from the means, it seemed that

it was in the expected direction. This supports Hypothesis 1, there appear to be differences between the effectiveness of balanced and non-balanced teams.

Hair *et al.* (1995, p: 79) recommended the use of regression analysis to explore "the relationships between a single dependent variable and several independent variables". In the current study linear and hierarchical multiple regression models were used to test the hypotheses for the proposed model for team work effectiveness in Egypt. Before running the regression analysis, some practical requirements and assumptions need to be discussed as suggested by Tabachnick and Fidell (1989) and Hair *et al.* (1995) to ensure that the regression results are representative of the sample. These relate to: (a) determining the sample size; which means ratio of cases to IVs; (b) identifying the outliers; (c) checking the multicollinearity among the IV s, and (d) checking the normality.

The sample size (ratio of cases to IV s): Hair *et al.* (1995, p: 105) and Tabachnik and Fidell (1989, p: 129) argued for the importance of achieving an acceptable ratio of cases to IVs, to ensure that the results can be generalised. They argued that the desired level is between 15 to 20 observations for each independent variable, and the minimum requirement ratio is 5 observations to 1 variable. In the current study the sample is 86 teams with four independent variables, which means that the ratio of cases to IV s is more than 20 to 1, which is considered acceptable as a desired ratio of cases to IVs in the regression analysis.

The outliers: Hair *et al.* (1995, p: 83) stated that the outliers are the observations that present inappropriate representations of the population from which the sample is drawn. Hair *et al.* (1995) argued that the outliers create problems for the analysis. Tabachnik and Fidell (1989, p: 67) stated that outliers are "the cases with extreme values on one variable or a combination of variables that can affect the results". Tabachnik and Fidell (1989, p:

67) argued that in the regression analysis "the outliers have much more impact on the regression coefficient than any other variable". They argued that outliers can lead to both type I and type II errors and in some cases the results can not be generalised. The Cook's distance measure is one of the indices that can be used to identify the outliers as suggested by Hair *et al.* (1995) and Tabachnik and Fidell (1989). The Cook's distance was calculated by the following formula (the outliers are the observations that are bigger than the calculated Cook's distance value):

$$\textit{Cook's distance} = 4/(n-k-1)$$

Where; n= sample size, and k= the number of the IV s and the control variables.

In the current study, Cook's distance measure was used to identify the outliers in each regression. The outliers found in each model were eliminated and discounted from the analysis. The number of outliers will vary for each regression model because the Cook's distance was calculated for different dependent variables (as discussed later in this chapter).

Multicollinearity: Tabachnik and Fidell (1989, p: 87) stated that multicollinearity means the independent variables are highly correlated (0.90 and above), and this can cause overlap in predicting the dependent variable or variables. To determine the multicollinearity among the IVs. Hair *et al.* (1995) suggested using the tolerance values and the variance inflation factor (VIF) values. Hair *et al.* (1995, p: 146) noted that "the tolerance value is 1 minus the proportion of the variables variance explained by the other predictors" and the VIF value "is the reciprocal of the tolerance value". They argued that high tolerance value and small value of VIF indicates little inter-correlation among the variables. The VIF value quite close to 1.0 means little collinearity among variables. Hair

et al. (1995, p: 146) argued that if these requirements met in the regression analysis, this indicated that "interpretation of the regression variate coefficients should not be affected by multicollinearity". In the current study, both of tolerance values and VIF values were used to test the multicollinearity among the independent variables. The tolerance values were high which ranged between 0.60 and 0.90 and the VIF values were small (all quite close to 1.0). These calculated values indicated little collinearity among the independent variables.

The normality: Tabachnik and Fidell (1989) argued for the importance of screening the normality in multivariate analysis to test the accuracy of the data. In the current study, to check the normality histograms were plotted. Inspection of the histograms indicated that the variables that were used in the current study were found to be approximately normally distributed.

As the requirements of the regression analysis were largely satisfied, the regression analysis models were run to test the proposed model of team work effectiveness. Four main regressions were conducted to test the hypotheses in two stages. In the first stage, two regressions were conducted the first with self-rated team beliefs as the DV, and the second with managers' rating of team beliefs as the DV. In the second stage, two regressions were conducted the first with self-rated team performance as the DV and the team beliefs as an intervening variable and the second with the managers' rating of team performance as the DV and the team beliefs as an intervening variable. To achieve complete results, the regressions were conducted for each model twice with the complete data set (N=86 teams) and again after eliminated the outliers, which were varying in each model (as explained later).

First, a linear regression model in which self-rated team belief was the dependent variable was run with team player styles, team autonomy, team structure and relative team size as the independent variables. Team experience and the absolute number of team members were entered as control variables. The regression was run twice first with the complete data set (N = 86 teams) and after discounting the outliers (N = 83 teams) in the first regression model as shown in Table 7.11 below. The Table shows the unstandardised regression coefficients, standard errors and level of significance. As shown from Table 7.11 the control variables were entered which are team experience and the absolute number of team members along with the IVs; team player styles, team autonomy, team structure and relative team size. The regression models' results with the full data set (N= 86) and after the outliers were supressed (N = 83) were only marginally different. With (N = 86), the coefficient of team structure with a level of significant ($p < 0.001$) seemed to have the most effect on self-rated team beliefs. The coefficient of relative team size is another variable seemed to have a marginally negative significant effect in explaining the self-rated team beliefs ($p < 0.10$). Team autonomy was marginally significant predictor of self-rated team beliefs ($p < 0.10$). From these results it could be concluded that team structure, team autonomy and relative team size are related to self-rated team beliefs ($R^2 = 0.29$; $F_{6,79} = 5.32$; $p < 0.01$). The results after eliminating the effect of the outliers (N= 83) indicated that only two variables have significant effects in self-rated team beliefs, these were team structure ($p < 0.001$) and relative team size ($p < 0.05$) ($R^2 = 0.29$; $F_{6,76} = 5.23$; $p < 0.001$).

Variables	Self-rated team beliefs	
	N = 86	*N* = 83
	Step 1	Step 1
Constant	1.94 †	1.81†
	(1.03)	(.99)
Team experience	.01	-.001
	(.02)	(.02)
The absolute number of team members	.02	.01
	(.03)	(.03)
Team player styles	-.25	-.09
	(.28)	(.28)
Team autonomy	.17†	.11
	(.10)	(.09)
Team structure	.66***	.64***
	(.14)	(.14)
Relative team size	-.09†	-.12*
	(.05)	(.05)
R^2	.29	.29
F	5.32***	5.23***
df	6,79	6,76

Table 7.11 Regression analysis for self-rated team beliefs. Note: Unstandardised regression coefficients are reported; standard errors are in brackets. † $p < 0.10$, *$p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Secondly, multiple regression models in which the managers' rating of team beliefs was the DV was run. Team player styles, team autonomy, team structure and relative team size were the IV s and team experience and the absolute number of team members in each team were the control variables. In this model self-rated team beliefs was treated as an intervening variable. The regressions were run twice with the all data set (*N*= 86 teams) and after discounted the outliers (*N* = 77 teams) as shown in Table 7.12. In the first step, the control variables and the IV s were entered in the analysis. The self-rated team belief was entered in the second step as an intervening variable. The results indicated some differences between the two models (full data set and outliers supressed).

With the all data set (*N* = 86 teams), the coefficient of the absolute number of team members in each team was the only variable that indicated significant effect in the managers' rating of team beliefs ($R^2 = 0.12$; $F_{7,78} = 1.56$). While with eliminating the effect of the outliers (*N* = 77), the coefficient of relative team size and the coefficient of the

absolute number of each team members showed the most significant effects in the managers' rating of team beliefs ($R^2 = 0.17$; $F_{7,69} = 2.01$; $p < 0.01$). From these results, it can be concluded that the managers' rated team's beliefs are positively associated with the absolute and relative team size.

Variables	**Managers' rated team beliefs**		**Managers' rated team beliefs**	
	***N* = 86**		***N* = 77**	
	Step 1	**Step 2**	**Step 1**	**Step 2**
Constant	5.84**	5.82**	5.99**	5.84**
	(1.87)	(1.93)	(1.65)	(1.66)
Team experience	-.01	-.01	-.02	-.02
	(.04)	(.04)	(.04)	(.04)
The absolute number of team members	.15 **	.15**	.10*	.11*
	(.05)	(.06)	(.05)	(.05)
Team player styles	-.32	-.32	-.65	-.67
	(.51)	(.52)	(.46)	(.46)
Team autonomy	-.11	-.12	-.11	-.14
	(.18)	(.19)	(.18)	(.19)
Team structure	-.27	-.27	-.02	-.10
	(.26)	(.29)	(.24)	(.26)
Relative team size	.12	.12	.21*	.22*
	(.09)	(.09)	(.08)	(.09)
Self-rated team beliefs	-----	-.01	-----	.17
		(.21)		(.20)
R^2	.12	.12	.16	.17
F	1.84	1.56	2.24*	2.01†
ΔR^2	---	.01	---	.01
df	6,79	7,78	6,70	7,69

Table 7.12 Regression analysis for managers' rating of team beliefs.
Note: Unstandardised regression coefficients are reported; standard errors are in brackets. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.0001$.

A further regression analysis was carried out with self-rated team performance as the DV and team beliefs as an intervening variable. Team player styles, team autonomy, team structure and relative team size were the IV s and team experience and the absolute number of team members were the control variables. The regression was run twice with the full data set ($N = 86$ teams) and after eliminating the outliers ($N = 78$) as shown in Table 7.13 below.

With (N= 86 teams), in the first step the control variables and IVs were entered in the analysis. In the second step, the same variables were entered with addition of the self-rated team beliefs as an intervening variable. With all data set, the coefficient of relative team size was the only variable that showed a significant effect in the self-rated team performance (R^2 = 0.20; $F_{7,78}$ = 2.74; $p < 0.01$). With the outliers suppressed (N= 78), the coefficient of relative team size and team experience showed significant effects on the self-rated team performance (R^2 = 0.36; $F_{7,70}$ = 5.67; $p < 0.001$). The relative team size was negatively related to the self-rated team performance. From these results, it can be concluded that from the perceived performance by the team members can be explained by their experience in team work (positively) and by relative team size (negatively).

Variables	**Self-rated team performance**		**Self-rated team performance**	
	***N* = 86**		***N* = 78**	
	Step 1	**Step 2**	**Step 1**	**Step 2**
Constant	4.84**	4.89**	3.29*	3.38*
	(1.85)	(1.91)	(1.64)	(1.70)
Team experience	.04	.04	.12**	.12**
	(.04)	(.04)	(.04)	(.04)
The absolute number of team members	.03	.03	-.02	-.01
	(.05)	(.06)	(.05)	(.05)
Team player styles	-.21	-.21	.21	.20
	(.51)	(.51)	(.46)	(.46)
Team autonomy	-.01	-.01	-.05	.06
	(.18)	(.19)	(.17)	(.18)
Team structure	-.05	-.03	-.08	-.05
	(.25)	(.29)	(.25)	(.27)
Relative team size	-.27**	-.27**	-.39***	-.39***
	(.09)	(.09)	(.09)	(.09)
Self-rated team beliefs	-----	-.02	-----	-.04
		(.21)		(.18)
R^2	.20	.20	.36	.36
F	3.23**	2.74**	6.72***	5.67***
ΔR^2	---	.00	---	.001
df	6,79	7,78	6,71	7,70

Table 7.13 Regression analysis for self-rated team performance. Note: Unstandardised regression coefficients are reported; standard errors are in brackets. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

A further multiple regression in which the manager' rating of team performance was the DV was performed. Team player styles, team autonomy, team structure and relative team size were the IVs; team experience and the absolute number of team members in each team were the control variables and the self-rated team beliefs was the intervening variable. The same analysis was run with the managers' rating of team beliefs as an intervening variable. The regressions were run with the all data set (N = 86 teams) and after discounted the outliers (N = 81 teams) as shown in Table 7.14 and Table 7.15 below.

First regression was run with the managers' rating of team performance as the DV and the self-rated team belief as an intervening variable. The same IV s and control variables were entered as explained in the previous analysis (as shown in Table 7.14 below). With the full data set (N = 86 teams), the coefficient of the absolute number of each team members was the only variable that showed a significant effect on the managers' rating of team performance. This was a negatively effect that means the more number of team members, the less performance will expected from the managers' point of view (R^2 = 0.10; $F_{7,78}$ = 1.21). While after eliminating the effect of the outliers (N = 81), the results indicated that team structure and the absolute number of team members in each team had marginal significant effects on team performance as perceived by the managers (R^2 = 0.14; $F_{7,73}$ = 1.71; $p < 0.10$). The absolute number of team members has a negative effect on the managers' perception of their team performance. From these results, it can be concluded that the perceived team performance by the team managers can be explained by the absolute number of team members (negatively) and team structure (positively).

In Table 7.15, the regressions were conducted with the managers' rating of team performance as DV and the managers' rating of team beliefs as an intervening variable. The same IVs and control variables were used. The regressions run twice with the all data set (N= 86 teams) and after eliminating the outliers (N = 81 teams). With the full data set

(N = 86 teams), the coefficient of the absolute number of team members was the only variable with a significant effect on the first step of the analysis. But in the second step, the managers' rating of team beliefs indicated a negatively significant effect in explaining the managers' rating of team performance (R^2 = 0.17; $F_{7,78}$ = 2.22; $p < 0.05$). This indicated that the managers' point of view of their teams' beliefs was the only variable with the significant effect on their assessment of the team performance. With the outliers suppressed (N = 81 teams) the coefficient of the absolute number of team members in each team, team autonomy, team structure were marginally significant predictors of managers' rating of team performance. The managers' rating of team beliefs showed a significant effect in the managers' rated team performance. The effect of team structure was positive while, the absolute number of team members, team autonomy and the managers' rating of team beliefs were negative (R^2 = 0.20; $F_{7,73}$ = 2.66; $p < 0.10$). From these results, it can be concluded that the perceived team performance by the team managers can be explained by the absolute number of team members in each team, team autonomy and the managers' rating of team beliefs (negatively) and by team structure (positively).

Variables	Managers' rating of team performance $N = 86$		Managers' rating of team performance $N = 81$	
	Step 1	Step 2	Step 1	Step 2
Constant	1.96	1.84	2.79†	3.00*
	(1.72)	(1.76)	(1.45)	(1.48)
Team experience	-.02	-.02	-.03	-.03
	(.04)	(.04)	(.03)	(.03)
The absolute number of team members	-.11*	-.11*	-.08†	-.07†
	(.05)	(.05)	(.05)	(.04)
Team player styles	.06	.07	-.09	-.11
	(.47)	(.48)	(.41)	(.41)
Team autonomy	-.12	-.13	-.20	-.18
	(.17)	(.18)	(.15)	(.15)
Team structure	.35	.31	.35†	.43†
	(.24)	(.27)	(.22)	(.22)
Relative team size	-.11	-.11	-.09	-.11
	(.08)	(.09)	(.07)	(.07)
Self-rated team beliefs	----	.06	----	-.13
		(.19)		(.15)
R^2	.10	.10	.13	.14
F	1.40	1.21	1.88†	1.71†
ΔR^2		.001	--	.01
df	6,79	7,78	6,74	7,73

Table 7.14 Regression analysis for managers' rating of team performance. Note: Unstandardised regression coefficients are reported; standard errors are in brackets. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Variables	Managers' rating of team performance $N = 86$		Managers' rating of team performance $N = 81$	
	Step 1	Step 2	Step 1	Step 2
Constant	1.96	3.46†	2.79†	4.23**
	(1.72)	(1.76)	(1.45)	(1.51)
Team experience	-.02	-.02	-.03	-.03
	(.04)	(.04)	(.03)	(.03)
The absolute number of team members	-.11*	-.06	-.08†	-.04†
	(.05)	(.05)	(.04)	(.04)
Team player styles	.06	-.02	-.09	.23
	(.47)	(.46)	(.41)	(.40)
Team autonomy	-.12	-.14	-.20	-.24†
	(.17)	(.17)	(.15)	(.14)
Team structure	.35	.28	.35†	.33†
	(.24)	(.23)	(.20)	(.19)
Relative team size	-.11	-.08	-.09	-.07
	(.08)	(.08)	(.07)	(.07)
Managers-rated team beliefs	----	-.26*	----	-.21*
		(.10)		(.08)
R^2	.10	.17	.13	.20
F	1.40	2.22*	1.89†	2.66**
ΔR^2	---	.07	---	.07
df	6,79	7,78	6,74	7,73

Table 7.15 Regression analysis for managers' rating of team performance. Note: Unstandardised regression coefficients are reported; standard errors are in brackets. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

7.7 Discussion

The aim of this study was to test the relationships that exist among the variables in the revised model based on the findings from Study One in another Egyptian manufacturing company. The chapter started with the modifications that had been suggested in the instrument based on Study One and ended up with running the main study on the chosen company (Mantrac Co.). The results from this study were derived from two levels of analysis; individual level and group level of analysis. The aim of the individual level of analysis was to test the reliabilities of the modified instrument, to compare them with Study One and to evaluate any relationships that exist among the scales. Also, the individual level of analysis aimed to identify the structure of the variables that were suggested from Study One and used in the scale and to test the underlying factors as suggested from Study One in the scale used in the current study (Study Two). The individual level of analysis also aimed to test the social desirability among respondents to validate the scales in terms of socially desirable response. This was based on the findings from Study One. The results from the individual level of analysis indicated that the internal reliabilities when compared with previous studies and with Study One were quite variable. Team heterogeneity, team efficacy and team psychological safety showed low internal reliabilities in both studies; Study One and the current study compared with the previous studies. For this reason, it was suggested not to include these variables in the factor analysis and the regression analysis. However, the correlation and descriptives will be reported at the group level of analysis to give indications of their correlations with other variables in the scale, which may be used in further studies (see Chapter Eight for details). The PTPS also indicated low internal reliabilities in both studies (Study One and Study Two), but there some improvement found in the internal reliabilities for Study Two (see Chapter Eight for details). The results at the individual level of analysis also indicated that the four team player styles are positively related to each other and also related to other variables. Autonomy aspects are positively related to each other and other variables in the

scale. Team performance measure (self-rated and managers'-rated) and team beliefs measures (self-rated and managers'-rated) are related to different variables in the scale (Table 7.4). For example, there are relationships between self-rated team performance with all variables in the scale except for team vision. The results indicated that there were positive and statistically significant relationships between self-rated team belief (team efficacy) and all variables in the model except team managerial support and team psychological safety. The results also indicated that there were some significant relationships between self-rated team belief (team potency) and all the variables in the model except in the relative team size. The results at the individual level of analysis also indicated that there is low correlations found between SDS and some variables in the suggested model. SDS was used to assess the used scale in the current study to evaluate its socially desirable response. For example; there were some statistically significant correlations found between SDS and contributor style, communicator style, challenger style, self-rated team performance, team managerial support, team leader behaviours (directing and coaching) and team psychological safety, which were ranged from 0.10 to 0.28. This low correlations between some variables in the proposed model and SDS means that the scales that used with respondents in the current study was not elicit a socially desirable response (Vella-Vrodrick and White, 1997) (see Table 7.4).

As a result of the various relationships that found among the variables, a factor analysis was performed to identify the underlying (latent) structure of the variables in the scale (after not include the variables with low internal reliabilities to help modify the hypothesised model from Study One). At the individual level of analysis, four factors were suggested as a result of an exploratory factor analysis on the scale. These factors were labelled: team player styles, team autonomy, team structure and relative team size. The idea of balanced teams and its relationship with team performance was addressed. As resulted from Study One, balanced teams should be computed and compared at the group

level of analysis. Therefore, a group level of analysis was used to compute the balanced team scores and to evaluate the relationships between balanced teams and other variables in the modified model and to test the hypotheses.

On the group level of analysis, team performance was measured with two dimensions; self-report and managers' report. On the managers' rating of team performance, there was a negative relationship found with managers' rating of team beliefs (team efficacy) (Table 7.9). The results indicated also that there are some statistically significant relationships found between team player styles (M), team autonomy, team structure, relative team size, self-rated team belief and self-rated team performance. The group level of analysis was also run to compute the balanced teams and non-balanced teams to evaluate their effectiveness. Team balance mix was used to calculate the balanced teams and non-balanced teams. The aim was to evaluate the relationships between balanced teams and self-rated team performance and managers' rating team performance and with all the other variables in the modified model. A group level of analysis was used, besides the above reasons, with the aim to discuss the hypotheses of the study as follow:

Hypothesis 1

There are differences between the effectiveness of balanced and non-balanced teams. (H1)

The first hypothesis aimed to test the relationship between the effectiveness of balanced and non-balanced teams. To test this hypothesis, a correlational analysis and *t*-tests were used. The analysis was done with the all variables in the current study as suggested from the factor analysis (Table 7.9). At the group level of analysis in the current study the number of teams were 86 teams, which is considered advisable to rum more advanced

analysis compared with Study One. It can be seen from the correlations in Table 7.9 that there were some positive relationships between overall team player styles (M) and team autonomy ($p < 0.05$), team structure, relative team size ($p < 0.01$) and a negative relationship with self-rated team performance ($p < 0.05$). Team autonomy was positively correlated with self-rated team beliefs ($p < 0.05$), with team structure ($p < 0.05$) and relative team size ($p < 0.01$). Team structure was positively correlated with relative team size and self-rated team beliefs ($p < 0.01$). Relative team size was negatively correlated with self-rated team performance ($p < 0.01$). Managers' rating of team performance was negatively correlated to managers' rating of team beliefs ($p < 0.01$). Then using *t*-test (one-tailed), it appears that there were some supports with significant at ($p < 0.01$ and $p < 0.001$) for the differences between balanced and non-balanced teams for team autonomy, team structure, relative team size, self-rated team belief and self-rated team performance. These differences were in the expected direction in all variables except for self-rated team performance. On managers' rating of team performance, the differences between balanced and non-balanced teams were in the expected direction but these were not statistically significant. The differences between balanced and non-balanced teams for managers' rating of team beliefs were not in the expected direction with a hint of statistically significant differences ($p < 0.10$). In general, it can be concluded that the differences between balanced and non-balanced teams were in the expected directions for all variables except for the managers' rating of team beliefs and self-rated team performance, which support Hypothesis 1 that there appear to be differences between the effectiveness of balanced and non-balanced teams.

Hypothesis 2

Team beliefs are positively associated with balanced team player styles and team design variables. (H2)

For the second hypothesis, the result from the correlation matrix (Table 7.9) indicated that only team autonomy and team structure were correlated with self-rated team belief ($p < 0.05$ and $p < 0.01$ respectively). In the current study, with a larger number of teams (86 teams compared with 19 teams in Study One), it provides a suitable data set to run the regression analysis to test the proposed model of team work effectiveness. The results from the regression analysis (Table 7.11) indicated that team structure, team autonomy and relative team size were related to self-rated team beliefs with N=86 teams. The results after eliminating the outliers indicated that team structure and relative team size were the only variables with significant effects in explaining self-rated team belief. The results from the regression analysis (Table 7.12) also indicated that relative team size was the most significant variable that had an effect in managers' rating of team belief. These findings showed a partial support to Hypothesis 2 that team beliefs (self-rated) is positively associated with team structure and team beliefs (managers' rating) is positively associated with relative team size. While, relative team size was found to be negatively associated with self-rated team beliefs. At the same time, the results did not indicate any positive association between balanced team player styles and self-rated team beliefs or managers' rating of team beliefs, which means not to accept the first part of Hypothesis 2.

Hypothesis 3

Team performance is positively associated with team beliefs. (H3)

From the correlation matrix (Table 7.9), there was a negative correlation between managers' rating of team performance and managers' rating of team beliefs. The results from the regression analysis (Tables 7.12 – 7.14) indicated that there was a significant effect of managers' rating of team beliefs in explaining mangers' rating of team performance, but this was a negative effect. This findings not supporting Hypothesis 3.

Hypothesis 4

Team performance is positively associated with balanced team player styles, team design variables and a positive team belief. (H4)

From the correlation matrix there were some negative correlations between self-rated team performance and team player styles and relative team size. The regression analysis (Table 7.13) indicated that self-rated team performance could be explained by the relative team size (negatively). The regression results (Table 7.14) also indicated that managers' rating of team performance could be explained by team structure (positively) and the absolute number of team members (negatively). The results from Table 7.15 indicated that managers' rating of team performance could be explained by team autonomy (negatively), managers' rating of team beliefs (negatively), team structure (positively) and absolute number of team members (negatively). These findings supported that team performance is positively associated with team design variables (team structure). While, there are some negative associations with team autonomy, absolute number of team members and team beliefs. Therefore, Hypothesis 4 is partial accepted.

7.8 Limitations of the study

There were various limitations found in this study, as a result of a number of different factors. In the current study, some limitations were found to be similar to Study One such as: the restrictions from the Egyptian organisations to conduct any research, the permission from the organisation to collect any data. In the current study the permission was given to collect data once from the team members, to distribute the questionnaires to specific departments only. The questionnaires were distributed with different languages (see Study One limitations for details).

In the current study, the type of teams mainly based on work teams, therefore, the possibility to generalise the relationships between team player styles, team design variables and team performance for all team types might not be applicable. Self-managed teams for example were not included in the current study, which might indicate more explanations that might support the team autonomy effect on team beliefs and on team performance. Some variables such as team heterogeneity, team efficacy and team psychological safety had lower internal reliabilities in Study One and Study Two. This could be explained by culture factors that might affect people behaviours' in Egypt (see Chapter Eight for more details).

7.9 Conclusion

Some conclusions can be drawn from individual level and group level of analysis in the current study. At individual level of analysis it can be concluded that there are some statistically significant inter-correlations between the variables in the scale that used in the current study after the suggested modifications from Study One. The scale had not elicit a socially desirable responses. The results from factor analysis indicated that some variables are grouped together in different factors according to their relatedness, which helped to identify the underlying structure of the variables that used in the modified scale. These factors are team player styles, team autonomy, team structure and relative team size. At the group level of analysis, it can be concluded that there are some statistically significant relationships found between the variables in the current scale. From the balanced and non-balanced teams comparison it can be concluded that balanced teams are more effective than non-balanced teams for team autonomy, team structure, relative team size and self-rated team belief. Self-rated team belief was positively associated with team autonomy, team structure and managers' rating of team belief is associated with managers' rating of team performance (Table 7.9). There was a correlation between managers' rating of team performance and managers' rating of team beliefs, but the regression analysis findings

indicated a negative significantly effect of managers' rating of team beliefs on managers' rating of team performance (Table 7.15). Also, self-rated team performance (Table 7.13) can be explained by relative team size (negatively), and by team experience (positively) while the results also indicated that managers' rating of team performance (Tables 7.14-7.15) can be explained by team structure (positively), team autonomy (negatively), managers' rating of team beliefs (negatively) and the absolute number of team members (negatively). Relative team size was negatively correlated with team performance, which might indicate that team members do not prefer a large number of members for their tasks. Team autonomy, team beliefs and relative team size were not in the expected directions in their relation with team performance in the proposed model of team work effectiveness in Egypt. The findings concerning team autonomy, team beliefs might be explained by the effect of the Egyptian culture (see Chapter Eight for conclusions). Egypt is classified as a high power distance, a strong uncertainty avoidance, which may have an impact on people's beliefs, on their way of doing their jobs and in controlling their relationships with their managers.

Some more modification in the proposed model of team work effectiveness in Egypt were recommended as a result of both individual and group level of analysis from Study Two as shown in Figure 7.2 below.

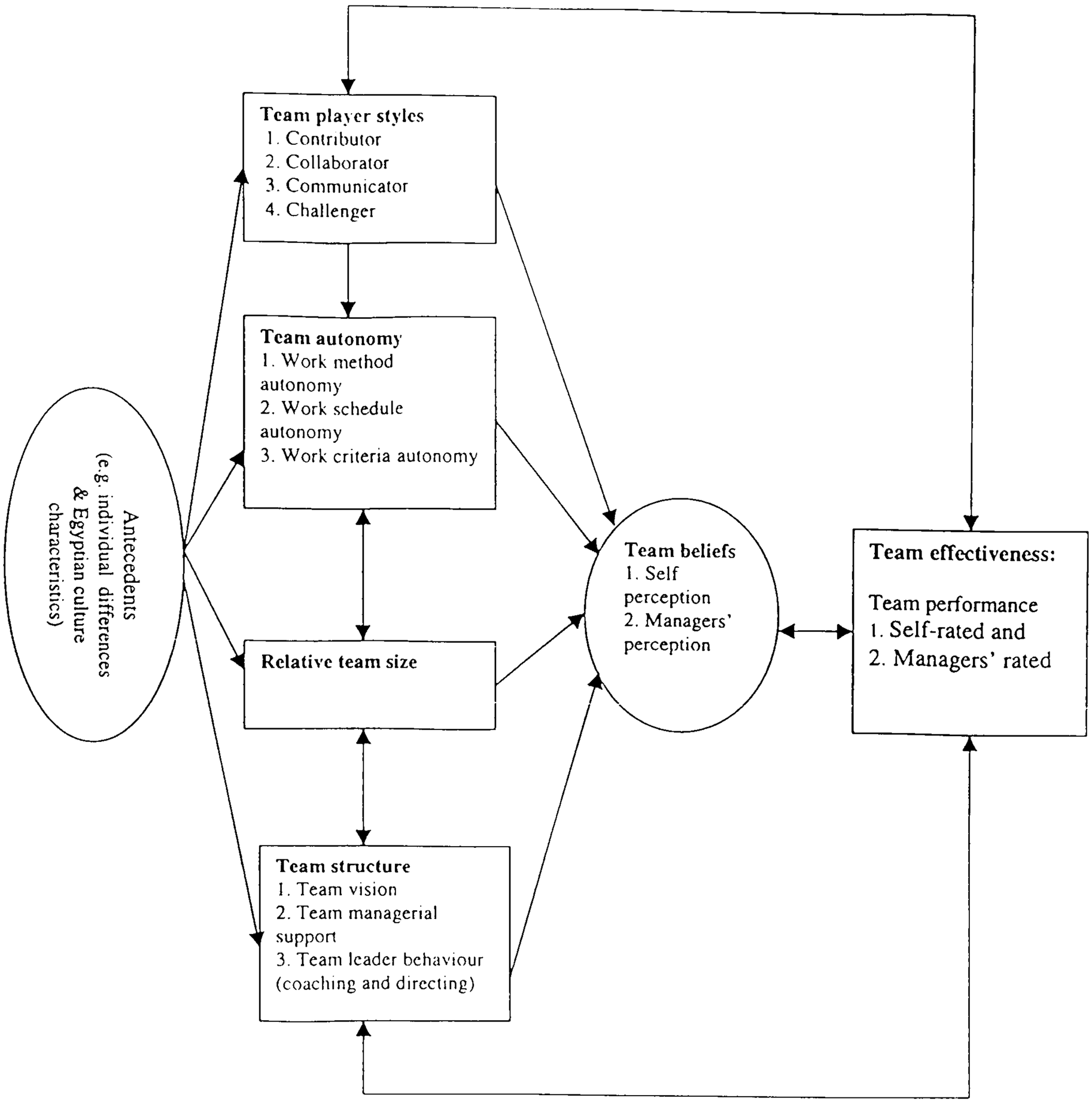


Figure 7.2 The second revised team work effectiveness model in Egypt.

7.10 Summary

This chapter has examined the modifications on the instrument and the variables used in the current study based on the findings from Study One, along with the pilot study that had been run before carrying out the main study on the second chosen Egyptian company (Mantarc Co.). A sample was chosen in the current study based on an examination of the team work in the company and based on the company's managers' recommendations. The analysis was run at two levels; individual and group level of analysis. Some conclusions were from both of analysis that helped to evaluate the revised model of team work effectiveness in Egypt as suggested from Study One. The current study suggested some

modifications on the revised model, which are presented in the second revised team effectiveness model (Figure 7.2) as a result of Study One and Study Two, which is recommended for team work in Egypt. The next chapter will focus on the findings from Study One and Study Two along with the findings from Appendix (A) all together with the aim of explaining the similarities and dissimilarities in these two studies with the recommendations for the management practices.

Chapter Eight

Conclusions and directions for further research

8.1 Introduction.

8.2 Overall conclusions.

8.2.1 At the individual level of analysis
8.2.2 At the group level of analysis

8.3 The revised model for team work effectiveness.

8.4 A critique of the research.

8.5 Directions for further research.

8.1 Introduction

The review of the literature encompassed team effectiveness models, team behaviour models, team player style model and different team design variables. The findings from the literature that suggested a link between team player styles, team design variables, team beliefs and team performance were encompassed within the model, which may lead to increase team effectiveness. The components of the proposed model were team player styles, team autonomy, team leader behaviour, team vision, team heterogeneity, team managerial support, relative team size, team psychological safety, team beliefs and team performance.

The initial proposed model was tested in two Egyptian companies (Iron and Steel Co. and Mantrac Co.). After Study One, the model was revised to include team player styles, team internal relations, team managerial issues, relative team size, team beliefs and team performance. The model was revised again after Study Two, to include team player styles, team autonomy, team structure, relative team size, team beliefs and team performance. The initial proposed model for team work effectiveness in Egypt was tested in Study One and Study Two with the aim of testing the following hypotheses:

H1: There are differences between the effectiveness of balanced and non-balanced teams.

H2: Team beliefs are positively associated with balanced team player styles and team design variables.

H3: Team performance is positively associated with team beliefs.

H4: Team performance is positively associated with balanced team player styles, team design variables and a positive team belief.

H1 was accepted in Study One and Study Two that there appear to be some differences between the effectiveness of balanced and non-balanced teams. H2, H3 and H4 were tested

in Study Two only due to the larger number of teams (86 teams compared with 19 teams in Study One). Partial acceptance for H2 and H4 were found and the findings did not support H3, therefore, it was rejected.

In the following section of this chapter the findings of the research will be considered in the context with previous research and a final model for team effectiveness in Egypt is developed. The researcher then presents a critique to the research-undertaken to-date and identifies direction for further research.

8.2 Overall conclusions

The aim of this part is to compare the findings from Study One and Study Two at the individual level and the group level of analysis to identify the common features in two Egyptian organisations. Next the findings from this research (Study One and Study Two) will be compared with previous studies' findings, which will then lead to revised the model for team work effectiveness in Egypt, which could form the basis for further research.

8.2.1 At the individual level of analysis

The internal reliabilities for the scales were quite variable compared with the previous studies, while only team heterogeneity, self-rated team belief (team efficacy) and team psychological safety showed low internal reliabilities in both studies (0.48, 0.49 and 0.56 for Study One respectively and 0.45, 0.41 and 0.40 for Study Two respectively) compared with 0.74, 0.63 and 0.82 respectively in previous studies (Campion *et al.*, 1993 and Edmondson, 1998). Cronbach α of 0.60 is considered as reasonable in organisational research in practice as suggested by Finkelstein (1992). Because of the similarities among Study One and Study Two concerning team heterogeneity, team efficacy and team psychological safety internal consistencies, these variables were eliminated from the factor

analysis and from regression analysis in Study Two, while they were included in the descriptives and the inter-correlations. The internal reliabilities for managers' rating of team performance and managers' rating of team efficacy showed slight improvement in Study Two compared with Study One (0.63 and 0.57 in Study Two and 0.45 and 0.31 in Study One respectively).

Low internal reliabilities for team player styles were found in Study One (ranged from 0.39 to 0.52) and in Study Two (ranged from 0.45 to 0.62). There were slight improvements in Cronbach α in Study Two compared with Study One, but these internal reliabilities were still not at the acceptable level as suggested by Nunnally (1978) except for the communicator style in Study Two with Cronbach α of 0.62, which may be considered as an acceptable level as suggested by Finkelstein (1992). However, in previous work by Kirnan and Woodruff (1994) the team player styles showed low internal reliabilities that ranged from 0.20 to 0.65 in students' samples and from 0.26 to 0.59 for business samples. Team player styles showed low internal reliabilities in Study One and Study Two, however, it was included in both studies for four reasons: (i) team player styles showed low internal reliabilities from previous studies but the internal reliabilities in Study Two showed slight improvement compared with both Study One and previous work (Krinan and Woodruff, 1994); (ii) The psychometric properties of PTPS were not provided by its developer (Parker, 1990), and the findings from Kirnan and Woodruff (1994) was the only study that had been found to measure the PTPS psychometric properties. However, Kirnan and Woodruff (1994) concluded that the PTPS instrument could be used as a useful measure for conducting research in team styles; (iii) team player styles have been seen as an important factor that had been studied in many other team effectiveness models (Hackman and Morris, 1975; Sundstrom *et al.*, 1990; Shea and Guzzo, 1992 and Cohen and Bailey, 1997) as well as in team behaviour models (Parker, 1990; Margerison and McCann, 1985 and Belbin, 1981); and (iv) the PTPS is one of the view measures available

for assessing team player styles. Therefore, it was important to evaluate team player styles based on team behaviour models and to integrate it with team effectiveness models with the aim of understanding and enhancing team work effectiveness in Egypt. For the reasons mentioned above, the PTPS despite its low internal reliabilities were included in the current research (Study One and Study Two) with the aim of adding knowledge to the psychometric properties of the PTPS and testing other team player models (not just focusing on Belbin's team role model) as suggested by Senior (1997).

With the aim of improving the PTPS psychometric properties, the researcher used students' samples in AAST-MT in Egypt between February and May 2000 to estimate the psychometric properties for PTPS as originally designed by Parker (1990), which is an ipsative long form of the instrument that consists of 18 statements with four possible ending answers and as modified by the researcher based on the findings of the pilot study in Egypt that suggested the use of only 10 statements from the original scale. Johnson *et al.* (1988) and Baron (1996) argued for some measurement problems in ipsative scales, moreover, Lord and Novick (1968) argued that an interval measurement might provide useful information compared with an ipsative measurement. Therefore, the modified instrument which was used in the current research (Study One and Study Two) was in short normative form and consists of 10 statements with four sub-statements in a Likert scale ranged from (5) strongly agree to (1) strongly disagree.

This supplementary study aimed to test the psychometric properties of the PTPS in students' samples and to test also its relationship with possible antecedents such as individual differences in cognitive styles as one of the potential antecedents of the proposed model for team work effectiveness in Egypt (see Appendix A for details). The results indicated that the PTPS as a short normative scale showed improved Cronbach α compared with both ipsative long and short forms. The internal reliabilities for the PTPS

ipsative long form ranged from (0.13 to 0.21) and from 0.14 to 0.35 for the PTPS ipsative short form, while the internal reliabilities for the PTPS normative short form ranged from 0.49 to 0.59. These findings suggested that the PTPS in a normative short form might be a more appropriate instrument for measuring team player styles in Egyptian context compared with the original ipsative long form. Therefore, the PTPS in a normative short form was used in this research (Study One and Study Two). The findings also found that the PTPS and the CSI measures two different constructs. Further work is required at the item level to improve the reliability and validity of the PTPS.

At the individual level of analysis, because the respondents' means were above the mid-point in Study One in the descriptives, it was suggested that the scale that was used might be affected by social desirability. SDS as a short form X1 as developed by Strahan and Gerbasi (1972) and based on Crowne and Marlowe's original scale of social desirability (1960) was used in Study Two to test the used scale in terms of socially desirable response. No correlations between SDS and other scales suggested that the scale that was used with the respondents did not elicit a socially desirable response (Vella-Brodrick and White, 1997). The findings from Study Two indicated that there are low correlations between SDS and some scales in the suggested model that ranged from 0.10 to 0.28, which indicated that the scales did not appear to elicit a socially desirable response. Moreover, the Cronbach α for SDS-X1 was also low.

From the factor analysis results in Study One and Study Two, it can be concluded that there are some factors found in both studies. For example; team player styles, team autonomy and relative team size. While Study One grouped all other variables in two factors; team internal relations and team managerial issues. In Study Two the other variables were grouped in only one factor, which is team structure. This is because some

variables with low internal reliabilities were not included in Study Two. In general, it can be concluded that the factor analysis gave similar results in both studies.

8.2.2 At the group level of analysis

The group level of analysis in both studies (Study One and Study Two) was used to test the hypotheses, which were formulated with the main variables, team player styles, team design variables, team beliefs and team performance. Team performance, which was hypothesised as being related positively to the balance of team player styles, positive team design variables and shared positive team beliefs, indicated different results from the two companies that were involved in the current research. The next part will discuss each variable in the model and the findings from both studies followed by an amended model for team work effectiveness in Egypt based on the findings from both the literature and from the current research.

Balanced team player styles is an important variable that was related to high team performance (Belbin, 1981; Margerison and McCann, 1985 and Parker, 1990). They argued that balanced team player styles are positively related to high performance teams. The findings from the current research (Study One and Study Two) indicated some similar and other inconsistent results. Team player styles were positively correlated with self-rated team beliefs at the individual level of analysis in Study One and in Study Two (Table 6.5 and Table 7.4), while the relationships between team player styles and self-rated team performance were quite different in both studies. Self-rated team performance was positively correlated with team player styles in Study One and negatively correlated to it in Study Two (Table 6.5 and Table 7.4).

At the group level of analysis, some of the four team player styles were positively associated with self-rated team beliefs in Study One and Study Two (Table 6.9 and Table

7.7), while some negative correlations were found between some of the four team player styles and self-rated team performance in Study Two (Table 7.7). The overall team player styles (M) as an indicator of balanced teams indicated slightly different results in both studies. Team player styles (M) were positively correlated with managers' rating of team performance in Study One and negatively correlated with self-rated team performance in Study Two. There were also positive correlations between team player styles (M) and self-rated team beliefs in Study One (Table 6.11 and Table 7.9). Team player styles (M) at the group level of analysis were correlated with other variables in the suggested model as resulted from the factor analysis in both studies. In Study One, team player styles (M) was positively correlated with team autonomy, team internal relations, team managerial issues and self-rated team beliefs (team efficacy and team potency). In Study Two, team player styles (M) was also positively correlated to team autonomy, team structure and relative team size.

It can be concluded that the PTPS findings from both studies were quite variable. Different findings were found at both the individual level and the group level of analysis in both studies, while the findings at the group level of analysis based on grouping the variables in the used scale as a result of the factor analysis indicated similar findings in both studies; that PTPS are positively associated with team design variables. The findings from the regression analysis did not provide any evidence to confirm the link between team player styles and team performance. Therefore, the findings from this research do not provide sufficient evidence to support the assumption that balanced team player styles is necessary condition for team work and team effectiveness. However, there is evidence to support the important role of team player styles in team effectiveness in Egypt.

Team design variables which were tested in the current research consisted of team autonomy, relative team size, team leader behaviour, team managerial support, team

vision, team heterogeneity, team psychological safety. Some variables were eliminated from the main analysis in Study Two as a result of low internal consistencies that were found in both studies. These variables are team heterogeneity, team efficacy and team psychological safety. Therefore, the next part will focus on the variables that were tested in both studies. However, in the research critique below, the findings and criticism for the use of these variables in the model will be discussed.

Team autonomy consisted of work method autonomy, work schedule autonomy and work criteria autonomy, which had been asserted as important variables for team performance and team effectiveness (Breaugh, 1985). Similar findings were found in both studies related to team autonomy. Both levels of analysis; the individual level and the group level of analysis indicated that team autonomy facets were positively correlated to each other in the current research (Study One and in Study Two) (Table 6.5 and Table 7.4). Team autonomy facets were positively correlated to some other variables in the used scale in the current research. For example, some facets of team autonomy were positively correlated with some variables at the individual level and the group level of analysis in both studies such as team leader directing, some team player styles, self-rated team beliefs and team managerial support (Tables 6.5, 6.9, 7.4 and 7.7). While, team autonomy was positively correlated with team vision, team heterogeneity, team leader coaching, relative team size at the individual and the group level of analysis in Study Two. Also, team autonomy in Study Two indicated some negative correlation at the group level of analysis with team psychological safety (Tables 7.4, and 7.7). The findings at the group level of analysis in both studies based on the factor analysis findings indicated similar results. Team autonomy was positively correlated with team player styles (M), team internal relations, team managerial issues and self-rated team beliefs in Study One and positively correlated with team player styles (M), team structure, relative team size and self-rated team beliefs in Study Two (Table 6.11 and Table 7.9). Based on the findings from the regression analysis,

team autonomy showed a positive impact on the way in which team members explain their team beliefs and also showed a negative impact on the way in which the managers explain and interpret the performance of their team members (Table 7.11 and Table 7.15).

It can be concluded that team autonomy in both studies indicated similar results that team autonomy has positive relationships with other variables in the proposed model such as team player styles, relative team size and team structure. Also, team autonomy can be used to explain the variance in self-rated team beliefs and managers' rating of team performance in the model for team work effectiveness in Egypt.

Team structure consisted of team vision, team leader behaviour and team managerial support in the second revised model for team work effectiveness in Egypt (in Study Two). This part will discuss each variable in both studies. *Team vision* was positively related with self-rated team beliefs, team managerial support and team leader behaviours in both studies at the individual level and the group level of analysis (Tables 6.5 and Table 7.4), while it was positively associated with three of the team player styles, team autonomy and relative team size in Study Two (Table 7.7). *Team leader behaviours* were positively correlated with team player styles, self-rated team beliefs and team managerial support in both studies. Team leader behaviours were also positively correlated with team vision and team autonomy in Study Two. While, the relationship between team leader behaviour and self-rated of team performance were quite variable in both studies. A positive correlation was found between team leader behaviour and self-rated team performance in Study One and a negative correlation was found in Study Two (Table 6.5 and Table 7.4). *Team managerial support* indicated similar results in both studies; positive relationships were found between team managerial support and team player styles, team vision and self-rated team beliefs. While team managerial support was positively related with team autonomy in Study Two. The relationship between team managerial support and self-rated team performance

indicated different results, a positive correlation was found in Study One, while the same relationship was negative in Study Two (Tables 6.5, 6.9, 7.4 and 7.7).

The findings at the group level of analysis based on the results from the factor analysis indicated similar results. In Study One, there were positive relationships between team internal relations, team managerial issues and self-rated team beliefs (Table 6.11). In Study Two, the positive relationships were found between team structure (team vision, team leader behaviour and team managerial support), team player styles, team autonomy, relative team size and self-rated team beliefs (Table 7.9). The findings from the regression analysis indicated that team structure is a significant predictor in explaining self-rated team beliefs (Table 7.11) and in explaining the managers' rating of team performance in the model for team work effectiveness in Egypt (Table 7.14 and Table 7.15). These findings indicated that team structure has an impact on the way in which team members explain their beliefs. Also team structure has an impact on the way in which the managers evaluate the team performance.

Relative team size indicated different results in both studies. In Study One relative team size showed a negative relationship only with team psychological safety (Table 6.9), while in Study Two, the results indicated that there were some positive relationships between relative team size and team player styles, team autonomy, team vision, team heterogeneity, team managerial support, team leader behaviour in directing and self-rated team beliefs (Tables 7.4 and 7.7). The results at the group level of analysis based on the factor analysis results showed positive relationships between relative team size and team player styles and team structure and a negative relationship with self-rated team performance (Table 7.9). From the regression analysis, it can be concluded that relative team size is a significant predictor in explaining self-rated team beliefs (negatively), managers' rating team beliefs

(positively), and self-rated team performance (negatively) in the model for team work effectiveness in Egypt (Tables 7.11, 7.12 and 7.13).

Team beliefs were measured by self-rated and manager-rated. Similar findings were found concerning the relationship between self-rated team beliefs (team efficacy and team potency) and other variables in the model in both studies. *Self-rated team beliefs* (team efficacy) was positively associated with the communicator style, two of the autonomy facets, team vision, team managerial support, team leader behaviour, team psychological safety in Study One and with the four team player styles, team autonomy, team vision, team heterogeneity, team leader behaviour and relative team size in Study Two. The relationships between self-rated team beliefs (team efficacy) and self-rated team performance were inconsistent in both studies; there was a positive relationship in Study One and a negative relationship in Study Two (Table 6.5 and Table 7.4).

Self-rated team beliefs (team potency) was positively correlated with the communicator and the challenger styles, self-rated team performance, team vision and team heterogeneity at individual level of analysis in Study One and positively correlated with the four team player styles, team autonomy, team vision, team heterogeneity, team leader behaviour, team managerial support and there was a negative relationship with self-rated team performance in Study Two (Table 6.5 and Table 7.4). Similar findings related to self-rated team beliefs were found at the group level of analysis in both studies. Self-rated team beliefs (team efficacy) was positively correlated to three of the team player styles, work method autonomy and team leader behaviour in directing in Study One and with three of the team player styles, team autonomy, team vision, team heterogeneity, team leader behaviour, relative team size and a negative relationship with self-rated team performance in Study Two. Self-rated team beliefs (team potency) indicated similar results in both studies at the group level of analysis, for example, there were positive relationships

between self-rated team beliefs (team potency) and the communicator style, work schedule autonomy in both studies, while there were positive relationships found with self-rated team performance, and work criteria autonomy in Study One and with team vision, team managerial support and team leader behaviour in Study Two (Table 6.9 and Table 7.7). Some positive relationships were found at the group level of analysis based on the factor structure, which indicated a positive relationship between self-rated team beliefs (team potency) and self-rated team performance in Study One and with team autonomy and team structure in Study Two (Table 6.11 and Table 7.9). Based on the regression analysis findings two significant predictors were found; team structure and relative team size. Team structure shows that there is a significant positive relationship with self-rated team beliefs and the relative team size shows that there is a significant negative relationship with self-rated team beliefs in the model for team work effectiveness in Egypt (Table 7.11).

Managers' rating of team beliefs (team efficacy) was only correlated negatively at the group level of analysis with managers' rating of team performance in Study Two (Table 7.7 and Table 7.9). From the regression analysis, managers' rating of team beliefs showed a significant positive relationship with relative team size (Table 7.12). Also managers' rating of team beliefs showed a significant negative predictor in explaining the managers' rating of team performance in the model for team work effectiveness in Egypt (Table 7.15).

Team performance was measured by self-report and managers'-report. *Self-rated team performance* at the individual level of analysis was positively correlated with self-rated team beliefs (team efficacy and team potency), work schedule autonomy, team vision, team heterogeneity, team managerial support, team leader behaviour in directing and coaching and team psychological safety in Study One (Table 6.5). While there were some negative relationships found in Study Two. For example, self-rated team performance was

negatively correlated with the four team player styles, self-rated team beliefs, team autonomy, team heterogeneity, team managerial support, team leader behaviour in directing and coaching and relative team size. A positive relationship was only found between self-rated team performance and team psychological safety in Study Two at the individual level of analysis (Table 7.4). At the group level of analysis, self-rated team performance showed positive relationships only with self-rated team beliefs (team potency) in Study One (Table 6.9 and Table 6.11) and negative relationships with two of the team player styles, self-rated team beliefs (team efficacy), two of the autonomy facets, team managerial support and relative team size, while some positive relationships were found with team psychological safety, team age, team experience and job experience in Study Two (Table 7.7). Based on the findings of the factor analysis, self-rated team performance was negatively correlated with team player styles (M) and relative team size (Table 7.9).

Managers' rating of team performance showed a few relationships with the variables in the model. For example, manager's rating of team performance was positively correlated with overall team player styles (M) in Study One and was negatively correlated with managers' rating of team beliefs in Study Two (Tables 6.11, 7.7 and 7.9).

The findings from the regression analysis indicated that relative team size is a significant predictor with a negative impact on the way in which team members evaluate their performance (Table 7.13). Team structure shows a significant positive relationship with managers' rating of team performance (Table 7.14). Also there were significant negative relationships with team autonomy, manager-rated team beliefs, the absolute number of team members and a significant positive relationship with team structure with the managers' rating of team performance in the model for team work effectiveness in Egypt (Table 7.15).

8.3 The revised model for team work effectiveness

As mentioned earlier (in Chapter Five) the conclusions that were drawn from the literature identified the need for empirical research based on the team work effectiveness models already developed (Cohen and Bailey, 1997, Sundstrom *et al.,* 1990, Campion *et al.,* 1993, 1996, Parker, 1990, Breaugh, 1985; 1998, Guzzo and Dickson, 1996, Bandura, 1982). Some variables were chosen to be tested in Egypt according to their essential effects on teams' effectiveness as found in the literature. The next part will discuss the findings, which were derived from previous research along with the main findings from this study (Study One and Study Two). This discussion provides the basis for development of an amended model for team work effectiveness in Egypt. The team work effectiveness model's development stages are presented in Figure (8.1 below), which presents the initial proposed model (stage a), the revised model based on the findings of Study One (stage b), the second revised model based on the findings of Study Two (stage c) and ending up with the amended model for team work effectiveness in Egypt (stage d). Stages a, b and c were presented in previous chapters in Figures 5.1, 6.2 and 7.2 respectively.

Team player styles. Parker (1990), Margerison and McCann (1985) and Senior (1997) stated balanced teams is an essential issue for high team performance and for team effectiveness. Parker (1990) noticed that effective teams consisted of an appropriate mix of team players to perform the tasks. Parker (1990) argued that the four team player styles are needed for each team to be balanced, which are the contributor style, the collaborator style, the communicator style and the challenger style. Parker (1990) also argued that there is no-research based instrument focused on the team player styles, therefore, he developed the Parker Team Player Survey (PTPS) for this reason. Previous research had revealed the importance of the link between team player styles and with other variables such as; a high degree of autonomy (Sprigg and Parker, 1998; Margerison and McCann, 1985; Breaugh, 1985), a shared vision (West, 1990), a positive organisational support with a supportive

leader (Hackman, 1990, Edmondson, 1999) and an ideal team composition (Campion *et al.*, 1993) to ensure high performing teams. The findings of this research do not provide sufficient evidence to confirm or to refute the assumption that a balanced mix of team player styles is a necessary condition to ensure team effectiveness in Egypt. The findings from this research do appear to indicate some differences in effectiveness between balanced and non-balanced teams, also the findings do provide a link between team player styles and other variables in the model such as team autonomy, team structure, relative team size and team beliefs. One of the problems that are related to the PTPS is that it is an ipsative scale, which different authors argued against (for example; Furnham *et al.*, 1993). One of the main findings that has been achieved in this research is the development of a short normative Arabic form of the PTPS, which appear to have better internal consistencies compared with the original scale that might be appropriate for the Egyptian context.

Team design variables. Team autonomy, team structure and relative team size will be discussed here. *Team autonomy.* Breaugh (1985) and Campion *et al.* (1993) argued for the impact of team autonomy on team effectiveness. Previous research supported a positive relationship between team autonomy and some other variables such as team performance (Parker and Wall, 1998), team leader behaviour (Pinnington and Haslop, 1995), managers' rating of performance (Yammarino and Dubinsky, 1990), team design variables such as team composition, team size, team rewards (Wageman, 1997) and productive performance outcomes (Hackman and Oldham, 1980). Some other findings from previous studies provided that autonomy had a negative effect on team performance (Kim and Lee, 1995) and also one study by Levi and Slem (1995) did not find any relationship between team autonomy and team members' perception of their effectiveness. The scale that were used in the current study is a new autonomy scale 'The Work Global Autonomy Scale' that Breaugh (1985) argued it is an alternative to the most commonly used team autonomy

measures (JDS and JCI). The findings of this research do provide some empirical psychometric evidences supporting the use of The Work Global Autonomy Scale. Also, the findings of this research support the positive relationships between team autonomy and team player styles and other design variables (that had been tested in the model) such as team leader behaviour, team vision, team managerial support, relative team size and with self-rated team beliefs. The findings of the current research also provide some empirical evidence that team autonomy shows that it is a significant predictor for self-rating of team beliefs and managers rating of team performance.

Team structure. The findings of previous studies had identified the importance of such factors as a shared clear vision (West, 1990, Guzzo *et al.,* 1993, Blanchard *et al.,* 1996 and Kivamaki and Elovainio, 1999), positive managerial support (Campion *et al.,* 1993) and positive relationships between team leader behaviour and team members (Guzzo and Dickson, 1996, Cohen *et al.,* 1996, Manz and Smis, 1987 and Ancona, 1990) for high performance and team effectiveness. The previous studies showed some relationships between team managerial support and team perception (Campion *et al.,* 1993). Guzzo *et al.* (1993); Bandura (1982) and Shamir (1990) provided a link between team leader behaviour and team potency and team performance. Team vision had a positive relationship with group potency (Guzzo *et al.,* 1993). The findings of this research do provide positive relationships between team structure and other variables in the model in both studies. The findings of this research do appear to provide empirical evidence supporting that team beliefs and team performance are related to shared team vision, positive team leader behaviour and high management support. The findings also have provided positive relationships between team vision and team player styles, team autonomy and relative team size. Also the findings yielded positive relationships between team leader behaviour, team managerial support and self-rated team performance. The findings of the current research provide some evidence that team structure shows that it is a significant predictor for self-

rated team beliefs and managers' rating of team performance in the model for team work effectiveness in Egypt.

Relative team size. The findings from the literature had indicated some positive relationships between relative team size and team vision (Aldag and Brief, 1981) and high group performance (Mullen and Copper, 1994), while, there was a negative relationship had been found between relative team size and team performance (Campion *et al.,* 1993). The findings of this research do not seem to provide consistent findings across the two Egyptian organisations that were involved. Some positive relationships were found between relative team size and team player styles, team autonomy, team vision, team managerial support, team leader behaviour and with self-rated team beliefs, while a negative relationship was found with self-rated team performance. The findings of this research concerning the relationship between relative team size and team beliefs was inconsistent between the team members and their managers, a positive relationship was found on managers' beliefs, while a negative relationship was found on the team beliefs. Also the findings do provide some negative relationships between relative team size and self-rated team performance. This could be because the team members perceived their size as not enough for their tasks.

Team beliefs. Previous literature had revealed a positive relationship between team beliefs and team performance (Gibson, 1999; Campion *et al.,* 1993; Edmondson, 1999; Guzzo and Shea, 1992; Bandura, 1982; Lindsley *et al.,* 1995 and Shea and Guzzo, 1987). Guzzo *et al.* (1993) and Sayles (1989) found a positive relationship between a strong-shared team beliefs that lead to high level of motivation, which had improved team performance. Guzzo *et al.* (1993) and Sundstrom *et al.* (1990) in their team performance models argued for the importance of the effect of group beliefs on group performance. Other findings from the literature had provided a positive link between team beliefs and team composition and

team vision and mixed team skills (Guzzo *et al.*, 1993 and Campion *et al.*, 1993) and team managerial support and team performance (Campion *et al.*, 1993). They found teams with specific team characteristics for example high autonomy, ideal relative team size, high managerial support, positive potency and with complementary skills of members were often more effective teams. The findings of this research do support the positive relationship between self-rated team beliefs, relative team size, team player styles, team autonomy, team vision, team managerial support and team leader behaviour. A positive relationship was found between team beliefs and team performance in Study One, while negative relationship was found in Study Two. The findings also do provide empirical evidences to confirm a significant positive relationship between self-rated team beliefs and team structure and a significant negative relationship between self-rated team beliefs and the relative team size. The findings of this research do provide some evidence of the negative relationship between managers' rating of team performance and managers' rating of team beliefs in the model for team work effectiveness in Egypt.

Team performance. Cohen and Bailey (1997) stated that self-perception of team performance and managers' perception of team performance were the most common measures that had been used to measure team performance. They argued in the half of the work teams studies objective measures were used as indicators of team effectiveness. Campion *et al.* (1996), Guzzo and Dickson (1996), Sadler-Smith (2001), Senior (1997), Cohen and Bailey (1997) and Edmondson (1999) argued for the importance of combining both measures of self-report and observers or managers-report of team performance. The findings of this research within the two Egyptian organisations did provide some evidence to support the relationship between team performance and other variables in the model of team work effectiveness in Egypt. Self-rated team performance showed some negative relationships with team player style, team autonomy, team managerial support and relative team size. The relationship between self-rated team performance and self-rated team

beliefs was positive in Study One and negative in Study Two. The findings of this research yielded a positive relationship with team player styles in Study One, while a negative relationship was found with managers' rating of team beliefs in Study Two. The findings of this research do provide some empirical evidence to confirm the assumption that self-rated team performance is influenced by relative team size (negatively). Managers' rating of team performance is influenced by team autonomy (negatively), team design variables such as team structure that consisted of team vision, team leader behaviour in coaching and directing and team managerial support (positively), and by managers' rating of team beliefs (negatively).

In conclusion, the initial proposed model of team work effectiveness in Egypt received mixed support. The results from Study One and Study Two provided support to some hypotheses of the study and suggested some modifications of the model upon these findings. The findings of the two Egyptian organisations used in the current study suggested focusing on team autonomy, team structure (team vision, team leader behaviour and team managerial support), team size and team belief and their significant effects on team performance outcomes. While the findings do not provide sufficient evidence to confirm or refute the assumption that balanced team player styles is a necessary condition for team effectiveness, however, the findings provide evidence to support the important role of team player styles in team effectiveness. There may be a culture explanation for this and certainly creating a team culture in organisations is an important factor. Creating a team culture means (i) the organisations supporting their teams members by encouraging them to work and evaluate their performance based on team rewards, (ii) giving more recognition to best team members, (iii) encouraging creating the shared team values among team members and their leaders. It can be concluded from the findings of this research and the limitations that had been found in both studies (see research limitations in Chapter Six

and Chapter Seven) that some modifications of the preliminary model for team work effectiveness in Egypt are recommended to be showed and to be tested in further research.

The amended model for team work effectiveness in Egypt incorporates some of the variables, which were developed based on the literature and based on the findings of Study One and Study Two, which suggested the appropriate variables to be tested as derived from the two Egyptian organisations that were involved in this research. These variables are team player styles, team design variables (team autonomy, team size, team structure and team rewards), team beliefs and team effectiveness (self-rating of team performance, managers' rating of team performance and team output records from the organisation as suggested by Cohen and Bailey, 1997). The amended model also includes some antecedents such as individual differences, the organisational culture and the Egyptian culture.

Team player styles are included in the amended model for team work effectiveness in Egypt based on the Parker's team player style model, which help identify the characteristics of the balanced teams in the organisations. The modified form of Parker Team Player Style Survey as a normative short form is suggested. Team design variables such as team autonomy, team structure and team size are included in the amended model (as presented in this thesis) because of their important effects on team effectiveness as resulted form the findings of this thesis. Team beliefs among team members as an important variable, which affect their performance is included in the amended model for team work effectiveness in Egypt.

There are other variables that might be related to team beliefs, which might help in shaping team beliefs in any organisation. These variables such as the team rewards, the organisational culture and the Egyptian culture (Campion *et al.*, 1993, Parker, 1990,

Hofstede, 1980 and Smith and Noakes, 1996). Therefore, these variables are suggested to be included in the amended model for team work effectiveness in Egypt.

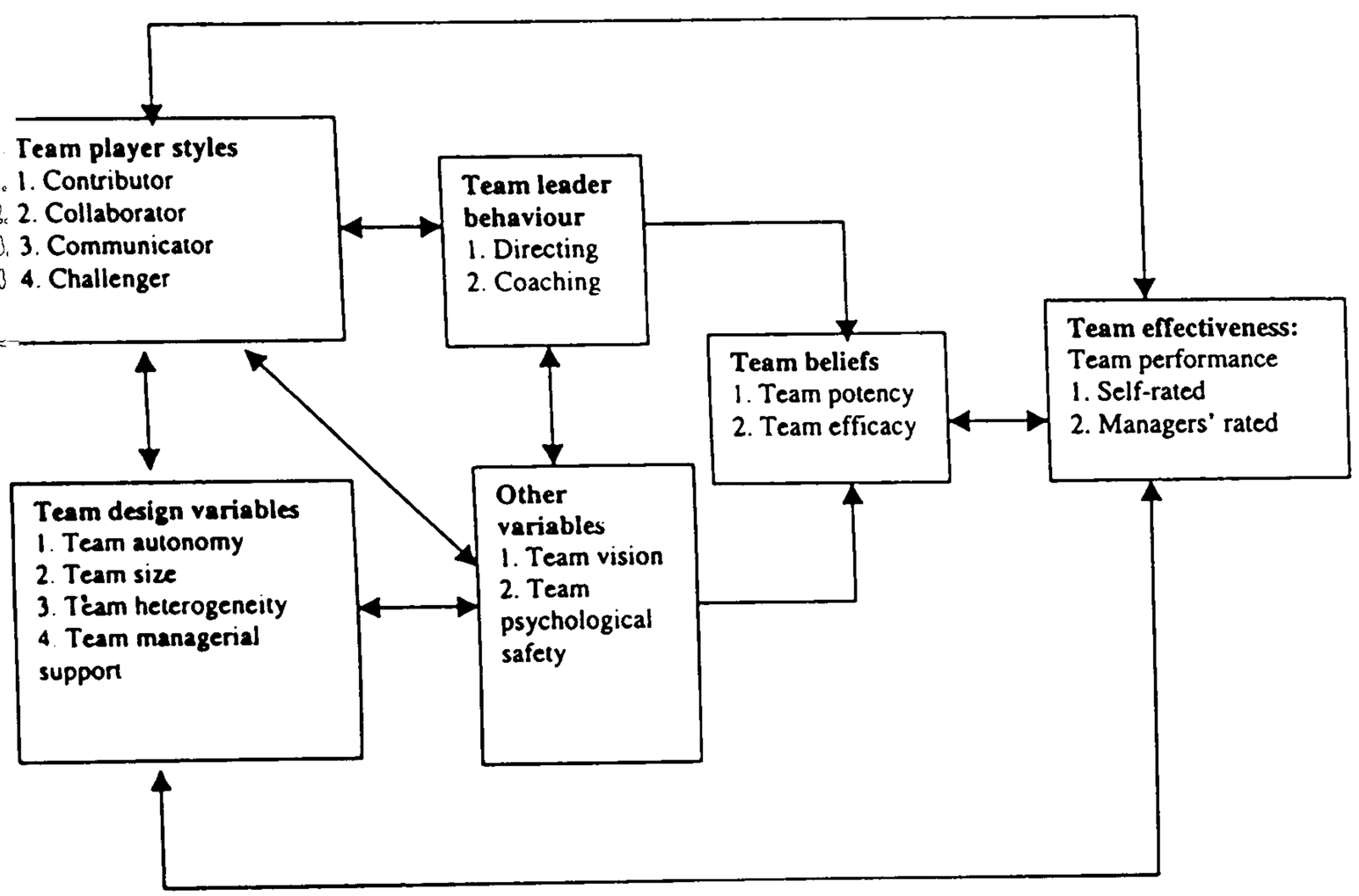
Team reward is included in the amended model for team effectiveness, which is thought to be as an important factor affecting team beliefs and team effectiveness (Campion *et al.*, 1993; Cohen *et al.*, 1996; Wageman, 1995 and Cohen and Bailey, 1997). Team-based bonus is recommended by Procter and Muller (2000) and by Sayles (1989) to ensure effective team performance, which might affect team members' motivation and then encourage them to work more that will lead to increase team effectiveness.

The organisational culture and the Egyptian culture are included in the amended model for team work effectiveness in Egypt, which would help identify the context that teams are embedded in. Parker (1990) argued for the examination of the team culture and the organisational culture, which might affect team beliefs and values. Hofstede (1980) argued that the national culture might affect the work related values in each nation, while Smith and Noakes (1996) argued that there are few studies which had been undertaken in previous team work literature that examined the cultural impact on team effectiveness. The Egyptian culture is included in the amended model for team effectiveness aiming to investigate the Egyptian culture that the teams are embedded in, which produce the work related values that affect their behaviour in the work place.

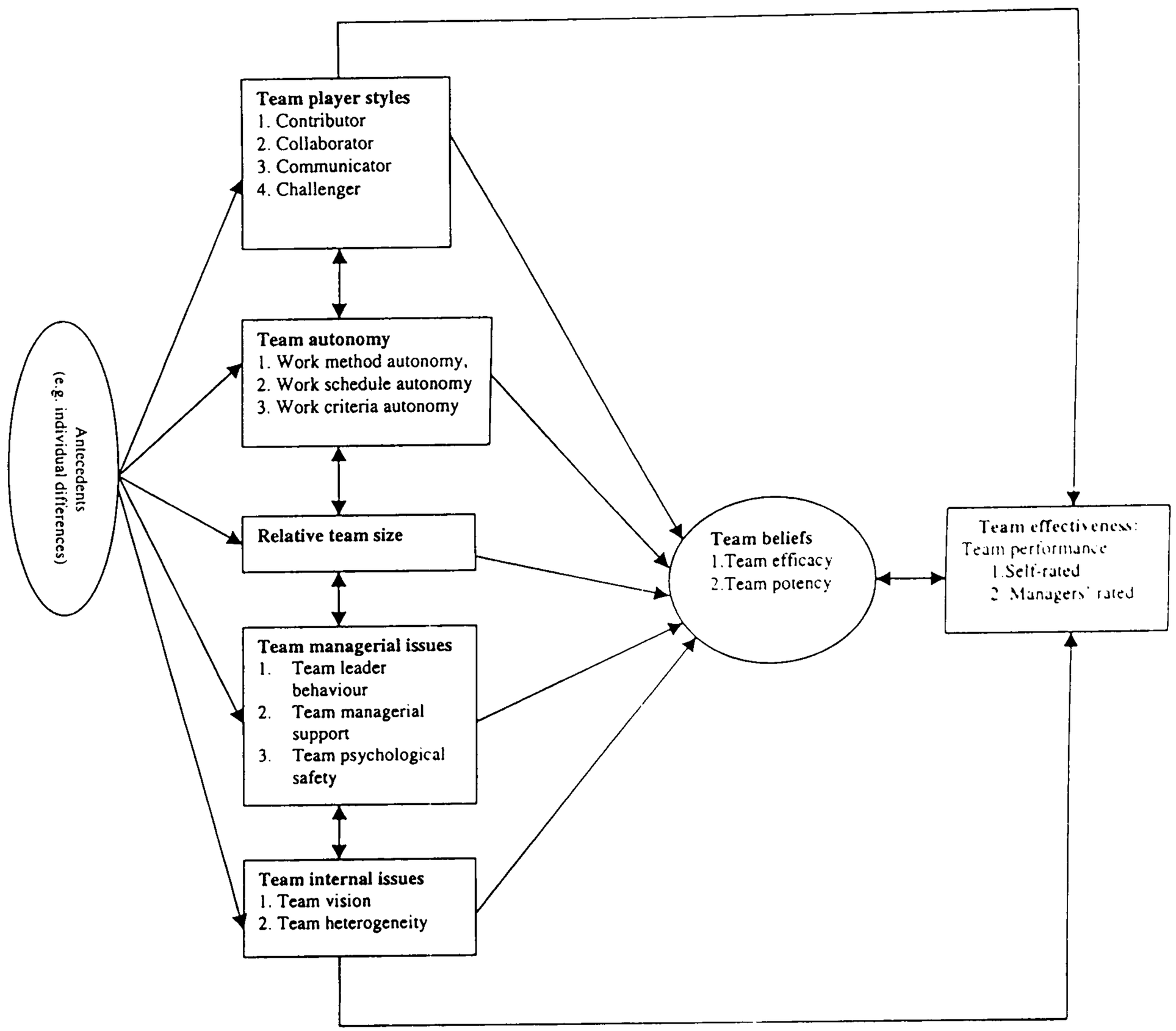
The individual differences such as cognitive style differences (Allinson and Hayes, 1996) are related to team performance, which might help explain the way team members interact and behave in the work place. Hayes and Allinson (1994) argued for the important contribution that cognitive style can add to the understanding of management practices. Hayes and Allinson (1994) suggested that understanding the cognitive style differences among individuals and teams can help in building better work relationships. Kirton (1989)

added that differences in cognitive style scores among individuals and their teams might lead to collaboration problems, which might affect work style (McHale and Flegg, 1986). Therefore, examining the cognitive style differences among the team members within their work place is an important variable that is thought to have important effects on team styles, team beliefs and values and team performance.

Scandura and Williams (2000) argued for the importance of the triangulation in collecting the data. In this thesis team effectiveness was measured (Study One and Study Two) by subjective measures only. Therefore, in the amended model team effectiveness is suggested to be measured with both subjective and objective measures as recommended by various team effectiveness models (for example, Cohen and Bailey, 1997). In the amended model for team effectiveness in Egypt team performance outcome measure (such as self-perception and managers' perception), and an objective measure of outcomes such as organisations' records are included. This might help to provide wider understanding of team effectiveness.

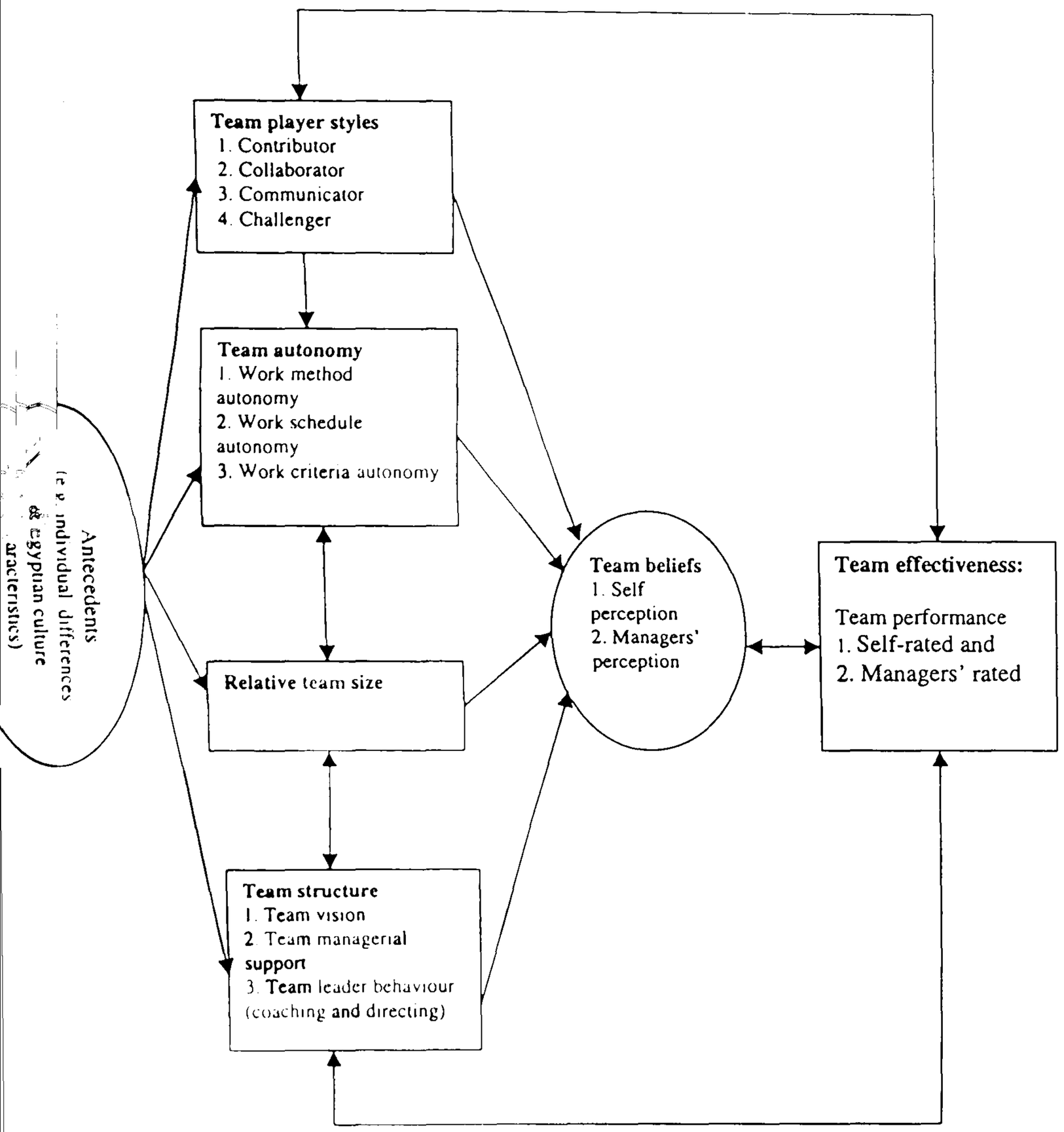


(a)

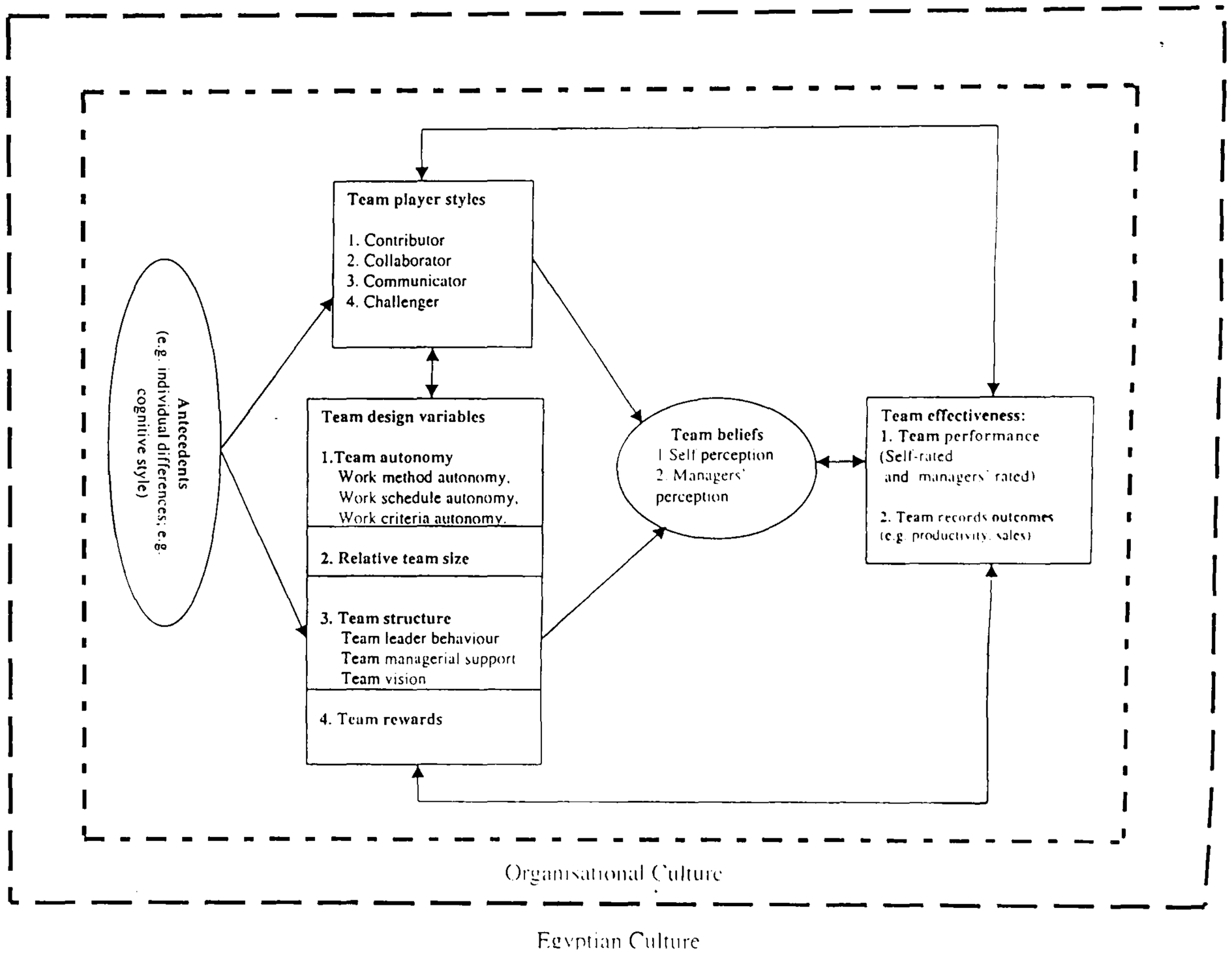


(b)

Figure 8.1: The team work effectiveness model's development stages.



(c)



(d)

Figure 8.1 (continue): The team work effectiveness model's development stages.

8.4 A critique of the research

There are various constraints and limitations to this research as a result of a number of different factors. Some of these factors had been addressed in the supplementary study (Appendix A) with the aim of providing some evidences of their effects in the team work effectiveness model in Egypt. However, there are still some limitations of the model that had not been studied and are described below.

The restriction from the Egyptian organisations in general to conduct any research was a limitation. Also, because there was no previous research found describing team work in Egypt, it was considered as the second limitation, which the researcher tried to deal with by running the Egyptian pilot study survey (see Chapter One for details). The organisations in this research were all located in Alexandria and Cairo only, where it was possible for the researcher to visit and collect data from, there was a difficulty of surveying all organisations in Egypt.

Part of the used scale in the current research (Parker Team Player Style) was from the Consulting Psychologists Press, Inc. (CPP). The PTPS is an ipsative scale, which is considered by some as a measurement problem in research and this creates a constraint, which led to the development of a normative scale for the current research. The permission form the CPP to use the PTPS instrument was occurred at the same time as the permission from the first company (Study One) to collect data. This was affected the testing of the psychometric properties of the PTPS in a normative short form (which is modified by the researcher) before carrying out the first main study, however, the researcher conducted a supplementary study after Study One had taken place (see Appendix A for details). The relative timing of these studies due to circumstances beyond the researcher's control, were not ideal.

The chosen samples (in Study One and Study Two) were as suggested by the managers in each company, which mainly used the work team type, therefore, other team types were not included in this thesis for these practical reasons. In both studies, Study One and Study Two, an access was given to the researcher to collect the data just once, therefore, the comparison between team members' performance after any specific period of time was not applicable. This means that a longitudinal study was not possible because of access difficulties.

Two languages were used in the used questionnaires, Arabic and English. The questionnaire was in English with the student samples (Appendix A) and also for managers' evaluations of their employees. While, the questionnaires that were distributed to team members in both companies were in Arabic. It might be better to use the same language in all questionnaires but not all team members in both companies could understand English well. Therefore, an Arabic translation was used to be sure of a clear understanding of words from all team members.

There are some variables, which have been tested in the model are eliminated from the main analysis for their unsatisfactory psychometric properties such as team heterogeneity, team psychological safety and team efficacy. For team heterogeneity scale, Campion *et al.* (1993) stated that some scales in the 'Work Group Characteristics Measure' (for example; team heterogeneity) showed low internal consistency, but they argued that the scale was reliable as a set. Campion *et al.* (1996) found that their heterogeneity scale, which they developed in 1993, was not consistent with its meaning. This might explain the findings from this research for the unsatisfactory internal reliabilities for team heterogeneity. The new items of team heterogeneity as developed by Campion *et al.* (1996) need to be tested in further research. The team psychological safety scale used in the current research showed low internal reliabilities in both studies. Edmondson (1999) argued team

psychological safety need to be created for individuals if they are to feel secure in their work place, which is predicted to facilitate any changes in the organisations. In the Egyptian organisations team psychological safety showed low internal consistency may be because team members seem to be afraid of expressing their real opinion according to their work environment. This might be related with the work-related values in Egypt, which might be affected by both high power distance and strong uncertainty avoidance that the Egyptian organisations working in (as classified by Hofstede, 1980). The team efficacy, as a new measure developed by Edmondson (1999) despite its low internal reliability with team members at individual level of analysis, had shown improvement with the managers' evaluation level. However, it is worth indicating that team members in Egyptian organisations do not like to express their feelings according to some cultural features in Egypt.

8.5 Directions for further research

This research has facilitated the development of a model for team work effectiveness in Egypt. This model encompasses team player styles, team design variables, team beliefs and team performance. This model may be used to inform the development of effective teams in Egypt and enhance knowledge and understanding of team effectiveness.

This thesis may help to overcome some of the difficulties of using the Parker Team Player Survey (PTPS) as originally designed, which is an ipsative form, by developing and testing an Arabic short normative form of the PTPS in Egypt, which might be validated when tested in further researches. The developed form of PTPS seems much more appropriate from the Egyptian's prospective and it is approved from the Consulting Psychologists Press. This thesis also provided further empirical support to a new scale of team autonomy, 'The Global Work Autonomy Scale', which is developed by Breaugh (1985). This scale was seen by its developer as an alternative scale to the most commonly used scales in

measuring team autonomy, Job Diagnostic Survey (JDS) and the Job Characteristic Inventory (JCI). This thesis provided empirical support for the reliability and the validity of the Global Work Autonomy Scale. However, the implications from the current research suggested some further research ideas and the methodological limitations of the present research.

There is little to date of empirically based research into different team types in Egyptian organisations. The literature (in English and in Arabic) had revealed a few empirical studies in Arabic countries in general and in Egypt specifically. There is clearly a need for further research in Egyptian organisations based on empirical data, which might help to establish the features of Arab and Egyptian organisations on which further research could be based.

The internal reliabilities of the PTPS were low, further studies might implement it in different settings, with more team members in each team, which might examine the differences in each style among the team members. Also this can suggest a redesign of the PTPS or its use in an alternative normative form in applied settings. This may be more useful to help compare between the Parker team player styles and other team styles models in further research, like Belbin's team roles and Margerison and McCann's team roles, which is not available to date. Also, further work on PTPS is required at item level to improve its reliability and its validity.

It is also proposed that further research might be useful to compare team performance in Egyptian organisations across time. Also this might be useful when combined with an examination of the team cultures that teams are working in. This can be used as a guide that will help to explain any progress in team performance within the organisations, and could be used to identify the most important factors that might affect teams in the work

place. Therefore, longitudinal studies are suggested that might be useful to compare teams' performance in Egypt across times.

Testing the amended model in different Egyptian organisations that used teams is recommended for example across manufacturing and services sectors in order to give a wider understanding of team work in Egypt. This may then provide a basic body of knowledge on teams in the Egyptian organisations on which more research might then take place. Developing and testing team effectiveness for other team types are recommended to help understanding the predictors of each team type. This would help provide the basis for further research in Egypt and facilitate the comparison between the different team types in Egypt.

The concept of team belief needs to be tested in different organisations since as Cohen and Bailey (1997) argued little empirical evidence is known about group potency and more research is needed to address its relationship with team performance. Team-based reward system needs to be investigated in the organisation with its effect on team beliefs, which might lead to effective teams in further research.

In order to develop and update our knowledge of management in Egyptian organisations a number of studies should be undertaken to investigate team management practices using some of the suggestions given here in different organisations in Egypt. This might help develop a wider and more complete understanding concerning management in the Egyptian context. This thesis might be seen as one of these studies that has begun this process but clearly further studies are needed.

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List of Appendices

Appendix A

Reliability estimate of the PTPS and its relationship with the CSI

Introduction

In the proposed model of team work effectiveness in the current study (see Chapter Five for details) Parker's team player styles (PTPS) was examined along with other variables that were drawn from the literature. Cognitive style may be considered as one of the antecedents in the proposed model of team work effectiveness in Egypt because it is concerned with the way individuals process information, which may in turn affect their behaviour at work and in group settings. By exploring Egyptian workers' personality characteristics, the differences in the way they behave, how they deal with each other and their relations in the work settings one may examine both the team player styles and the cognitive styles of the team members in the work place.

The PTPS survey was originally designed with an ipsative scoring system and some researchers have argued strongly against the use of ipsative scales for making comparisons between people (Johnson, Wood and Blinkhorn, 1988; Clemens, 1966; Hicks, 1970). Saville and Willson (1991) noted that ipsative scoring might overestimate reliabilities. Johnson, Wood and Blinkhorn (1988) argued that the means and the standard deviations that derived from ipsative scales are not independent and are difficult to interpret in the usual way. Some researchers have argued that using ipsative or normative scales of the same construct could produce the same results. For example, Merritt and Marshall (1984) concluded that both form ipsative and normative forms of the Learning Style Inventory (Kolb, 1976) were equivalent in their reliabilities and construct validity in measuring the same characteristics. Tamir and Lunetta (1977) stated that both ipsative and normative procedures had high reliability for cognitive preference tests.

Allinson and Hayes (1996) argued for the importance of cognitive style in relation to team composition and task design. Hayes and Allinson (1994) identified many dimensions of cognitive style. For example, the Myers-Briggs-Type Indicator (MBTI) (Myers and Briggs,

1976) is used to explain individuals' personality characteristics. MBTI is a commonly used instrument to classify people according to a Jungian theory of personality type. Thorne and Gough (1991 in Furnham and Stringfield, 1993) argued that MBTI had been found correlated with many other major personality measure. Allinson and Hayes (1996) found cognitive style scores using their Cognitive Style Index (CSI) to be correlated with the four dimensions of the MBTI. Berry, Poortinga, Segall and Dasen (1992) argued that there is a relationship between cognitive style and performance. Schroder (1989 in Hayes and Allinson, 1994, p: 65) suggested that "cognitive style may be an important predictor of performance". Hayes and Allinson (1994, p: 64) argued "employee behaviour is a product of both cognitive style and variables such as knowledge and skills". Brundage and MacKeracher (1980 in Hayes and Allinson, 1994, p: 54) referred to cognitive styles as "consistent individual differences in the way of organising experience into meanings, values, skills and strategies". Kogan (1980 and Robertson, 1985 in Hayes and Allinson, 1994, p: 54) argued that "cognitive style produce consistent behaviours across a wide variety situations". Cognitive styles according to Messick (1984 in Hayes and Allinson, 1994, p: 61) is defined "in terms of manner, form and typical nature of performance". Allinson and Hayes (1996) referred to the potential value of cognitive style and its relationship with organisational behaviour, which may help to explain the way the managers handle problems and can help to explain individual differences in the work place. Hayes and Allinson (1994, p: 67) argued for the important contribution that the cognitive style can add to the management practice, however, they argued that "within the area of industrial and organisational psychology, cognitive style has been a relatively neglected concept". Witkin and Goodenough (1981 in Berry *et al.*, 1992) referred to cognitive style as individual differences in how people process information. Based on Kirton's work (1989), Hayes and Allinson (1994) argued that cognitive style might affect the way people interact in work settings. Hayes and Allinson (1994) suggested that understanding the cognitive style differences among individuals and teams can help

building better work relationships. They also added that high differences in cognitive style scores among individuals and their teams might lead to collaboration problems (Kirton, 1989) and might affect work style (McHale and Flegg, 1986).

Aim

In a supplement to the main investigations in Iron and Steel Co., and Mantrac Co., the researcher aimed to achieve two goals. The first was to test the PTPS on two students' samples to estimate its psychometric properties, in the ipsative form as originally designed and then in an ipsative short form and in a normative short form as modified and used by the researcher in Iron and Steel Co. The researcher hoped through this study to support the modifications she made to the PTPS. The researcher had permission from CPP for using PTPS as a normative short form and one aim of this study was to add to the small body of knowledge of the psychometric properties of the PTPS. The second aim of this supplementary study was to investigate the relationship between cognitive styles and team player styles and to help explore the relationships between PTPS and one of the potential antecedents in a proposed modification to the model by using students' samples.

Method

Participants

Two samples were used in this study. **Sample A** (N = 114) comprised undergraduate students who were enrolled in Organisation Design course in College of Management and Technology at Arab Academy for Science and Technology and Maritime Transport in Alexandria, Egypt (AAST-MT). In total 97.3 per cent of this sample completed the PTPS ipsative long form (111 students, 51 male and 60 female, the mean age of the sample as a whole was 19.03 years, S.D. = 1.58). From this sample 86.8 per cent (99 participants) went on to complete the PTPS ipsative short form (43 male and 56 female). While, 88.5

per cent of this sample only completed CSI (101 students, 45 male and 56 female). **Sample B** (N = 110) comprised undergraduate students who were enrolled in Management (2) course drawn from the same College of Management and Technology as Sample A. In total 90.9 per cent of this sample completed the PTPS normative short form twice with a three month time period between administrations (100 students, 46 male and 54 female, the mean age of this sample was 19.12 years (S.D. = 1.59). While, only 63.6 per cent of this sample completed the CSI once (70 students, 30 male and 40 female) at T_1.

Research instruments

In total, four instruments were employed in this study.

The PTPS (ipsative long form) consisted of 18 statements each with four possible ending answers The respondents were asked to place number 4 next to the ending that is most applicable to them and number 1 next to the ending that is least applicable to them.

The PTPS (ipsative short form) consisted of ten statements only from the original scale developed by Parker (1990). These ten statements were thought to be those which were most appropriate and relevant to Egyptian culture. More importantly there were some items that were rejected from PTPS scale as a result of a pilot study (that targeted twenty persons working in AAST-MT). The result from the pilot study showed that some items, even in translation, were difficult to understand and others were not appropriate to Egyptian culture and may have caused response problems. Therefore, some items were excluded (numbers: 3, 5, 6, 9, 12, 15, 16 and 17). Examples of some of words in the rejected items were for example: "overuse humor" and "other tension-reducing device"; "too laid-back or shortsighted", "self-righteous"; "nitpicker"; "dishonest"; "heartless"; "play devil's advocate far too long". Hatem (1994) noted that there is increased use of Western-based models in Egypt, but Egyptian researchers should take into consideration

the local cultural context by being sensitive and aware of using the appropriate language and terminology.

The PTPS (normative short form) consisted of the same ten statements that were used in the ipsative short form but was used with a normative scale as modified by the researcher. Items were responded to on a five point Likert scale from strongly disagree (1) to strongly agree (5) in order to present all the statements in the same format.

The Cognitive Style Index (CSI). The cognitive style was measured using the Cognitive Style Index (CSI) developed by Allinson and Hayes (1996, p: 121) as a new measure of cognitive styles that they argued is "designed specifically for the use with managers and professionals". They added that their new measure of cognitive style is "psychometrically sound and convenient to administer". CSI is a self-report questionnaire that consists of thirty-eight items, with a trichotomously true-undecided-false response scale. Twenty-one of the items indicated an analysis orientation and the other seventeen items indicated an intuitive orientation. Allinson and Hayes (1996, p: 122) used intuition term to describe characteristics of a 'right brain' orientation and refers to "immediate judgement based on feeling and the adoption of global perspective", while analysis was defined to describe characteristics of 'left brain' orientation and refers to "judgement based on mental reasoning and a focus on details". The maximum total score of CSI is 76, the higher the score, the more analytical style would be.

Procedures

All respondents participated voluntarily in the study during the normal class time in the first semester 2000. The administration time was approximately 30 minutes for each PTPS questionnaire and was approximately 20 minutes for CSI questionnaire. The PTPS ipsative short form was administered to the students six weeks from the administration of the PTPS

ipsative long form. The CSI was administered to part of the students from Sample A, who completed the PTPS ipsative long form and to part of the students from Sample B, who completed the PTPS normative short form at T_1. The questionnaires were distributed via the researcher by hand to the students. The PTPS ipsative long form was distributed in the first part of the Organisation Design lecture (by the researcher), and the CSI was administered after the break in the second part of the same lecture. The PTPS ipsative short form was distributed to the same students in Organisation and Design lecture by the researcher six weeks period from the administration of the PTPS ipsative long form. The PTPS normative short form was distributed to the Management (2) students twice. The first administration was in the first part of the normal lecture in February 2000 and the second one was three months later (May 2000). The CSI was distributed to the Management (2) students in the second part of the Management (2) lecture (February 2000) after the break time.

Results and discussion

Table 1 shows the means, standard deviations, internal consistencies (Cronbach's alpha coefficients) and scale inter-correlations for the instruments administered to Sample A. The internal consistencies for the PTPS long ipsative form ranged from 0.09 to 0.21 and for the PTPS short ipsative form ranged from 0.14 to 0.35. The Cronbach's alpha coefficients for PTPS short form were better compared with the long form. This could suggest an improvement in the reliabilities in the PTPS short ipsative form compared with the PTPS long ipsative form. These data suggest that the internal reliabilities for the short form are superior to those for the long form of the PTPS, however, in both cases the reliabilities are not satisfactory. While, the Cronbach's alpha coefficient for CSI was 0.52. Pearson Product Moment PPM correlation coefficients calculated between CSI and PTPS ipsative long form indicated no significant correlations found between the four team player styles and the CSI scores.

Team player Styles	Long (*N*=111)			Short (*N*=99)			Inter-correlations				
	M	SD	α	M	SD	α	1	2	3	4	CSI
1. Contributor	2.49	0.26	0.13	2.49	0.36	0.14	----	-0.42**	-0.47**	-0.02	0.06
2. Collaborator	2.62	0.27	0.15	2.74	0.40	0.30	-0.24*	-----	-0.19*	-0.37**	0.07
3. Communicator	2.51	0.30	0.21	2.61	0.42	0.35	-0.37**	-0.33**	-----	-0.50**	-0.18
4. Challenger	2.35	0.26	0.09	2.14	0.36	0.25	-0.28**	-0.33**	-0.29**	-------	0.07
5. CSI (*N*= 101)	43.47	6.84	0.52	----	-----	----	------	-------	-------	------	-----

Table 1: Descriptive statistics, α coefficients and inter-correlations for PTPS ipsative long and short forms and for CSI (the long form inter-correlations are above the diagonal and the short form inter-correlations are below the diagonal). Note: * $p < 0.05$, ** $p < 0.01$.

Table 2 shows the means and standard deviations, internal consistencies and inter-correlations for the instruments administered to Sample B. The internal consistencies (Cronbach's α coefficients) for the PTPS normative short form which ranged from 0.37 to 0.46 in T_1 and ranged from 0.49 to 0.59 in T_2. The Cronbach's α coefficients for PTPS short form were better in T_2 compared with T_1. While, the Cronbach's α coefficient for CSI was 0.40. Pearson Product Moment PPM correlation coefficients calculated between CSI and PTPS normative short form indicated a negatively and statistically and significantly correlations found between the challenger team player styles only and the CSI scores.

Team player Styles	T_1 (N=100)			T_2 (N=100)			Inter-correlations				
	M	SD	α	M	SD	α	1	2	3	4	CSI
1.Contributor	4.02	0.39	0.39	4.09	0.42	0.55	----	0.36*	0.33**	0.39**	-0.14
2. Collaborator	3.97	0.39	0.46	4.11	0.40	0.58	0.49**	-----	0.53**	0.52**	-0.20
3.Communicator	4.00	0.38	0.37	4.16	0.41	0.59	0.61**	0.68**	-----	0.51**	-0.11
4. Challenger	3.90	0.39	0.43	4.97	0.41	0.49	0.66**	0.62**	0.56**	-------	-0.25*
5. CSI (N= 70)	43.37	5.96	0.40	----	----	-----	-----	------	------	------	------

Table 2: Descriptive statistics, α coefficients and inter-correlations for short form of PTPS (T_1 inter-correlations are above the diagonal and T_2 inter-correlations are below the diagonal). Note: *$p < 0.05$, ** $p < 0.01$.

General Discussion

This study provided evidence in supporting the improved psychometric properties of the PTPS as a short normative scale. Table 3 presents a summary table for the results of the study. Indeed, the obtained reliabilities for the four team player styles among the students samples would appear to be higher in the short ipsative form (ranged from 0.14 to 0.35) compared with the long ipsative form (ranged from 0.09 to 0.21). A comparison between PTPS short ipsative and PTPS normative form supported the idea that the PTPS normative short form has better internal consistencies based on the better α coefficients that were found for the four team player styles in the PTPS normative short form. The PTPS internal consistencies for the four team player styles that found by Kirnan and Woodruff (1994), (the only available study that tested the PTPS psychometric properties) ranged from 0.20 to 0.65 in the student sample and from 0.26 to 0.59 in the business sample. The findings from the current study suggested that the PTPS as a normative short form had higher reliabilities for the four team player styles (ranged from 0.49 to 0.59) compared with the PTPS as an ipsative short form (ranged from 0.14 to 0.35) and compared with previous work by Kirnan and Woodruff (1994) in which values ranged from 0.20-0.26 to 0.65-0.59. These findings suggest that the revised PTPS normative short form may be a more appropriate measure for the measuring Egyptian team player styles than is the original

ipsative long form. The findings from the correlation matrix indicated that both forms of PTPS (long and short ipsative forms) were similar across the two samples. The inter-correlations between the four team player styles were negatively and statistically significantly correlated to each other in sample A and positively and statistically significantly correlated to each other in Sample B. This could be explained by the different scale types that were used.

The findings of the CSI's internal consistencies (Cronbach α) were unsatisfactory in Sample A and sample B (0.52 and 0.40 respectively), which were below the recommended level of the internal consistency as recommended by Nunnally (1978). The findings from this study were low compared with the value found by Allinson and Hayes (1996), and by Sadler-Smith *et al.* (2000), however, it is higher than the Cronbach α found for the four team player styles in the same samples. The results from the Pearson Product Moment correlation suggested that PTPS ipsative long form and CSI scores were not correlated. Also, the result from this study suggested that the three team player styles (contributor, collaborator and communicator styles) based on the PTPS normative short form and the CSI were not correlated. There was a negative correlation found between CSI scores and the challenger style, which could be predicted from style theory given that analytics tend to be rigorous in following rules and procedures. The PTPS based on Jung's theory of personality, which was commonly tested by MBTI. Allinson and Hayes (1996) found some statistically and significantly correlations between CSI and MBTI with correlations coefficients ranged between 0.41 to 0.57. The findings from the current study may suggest that the PTPS instrument (Parker, 1990) is different from MBTI as Parker argued when developed PTPS instrument. Also, the values for the normative short form approach the value of 0.60 suggested by Finkelstein (1992) for organisational research (with the exception of the psychometric properties of the challenger scale).

In general, it can be concluded that this study provided evidence in support of the PTPS normative short form compared with those of the PTPS ipsative long and short forms. The findings also provided evidence that the PTPS (ipsative long form and normative short form) and the CSI are not correlated except in the case of the challenger scale (the least reliable of the PTPS scales) with normative short form of PTPS. It can be also concluded that the findings from this study suggested that PTPS and CSI measure two separate constructs.

Scale response	**Team Player Styles**	**T_1**	**T_2**	**Sample**
Ipsative Long	1. Contributor	0.13	--	A
	2. Collaborator	0.15	--	
$N = 111$	3. Communicator	0.21	--	
	4. Challenger	0.09	--	
Ipsative Short	1. Contributor	0.14	--	A
	2. Collaborator	0.30	--	
$N = 99$	3. Communicator	0.35	--	
	4. Challenger	0.25	--	
Normative Short	1. Contributor	0.39	0.55	B
	2. Collaborator	0.46	0.58	
$N = 100$	3. Communicator	0.37	0.59	
	4. Challenger	0.43	0.49	

Table 3: Summary Table for α coefficients for the PTPS both ipsative long and short forms and PTPS normative short form that used in the current study.

Appendix B

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Appendix C

Questionnaire items

The Questionnaire: (Back translation)

Team player style:

1- During the team meetings, I usually:

- Present information and technical data to the team.
- Make the team focus on its goals.
- Make sure that every team member involves in the discussion.
- Make questions about the goals of the team.

2- Relating to the team leader, I:

- Suggest that our work will be goal directed.
- Try to give him/her a hand to build a positive team climate.
- May disagree with him/ her if necessary.
- Offer advice through the frame of my experience.

4-When there is conflicts among the team members, I usually:

- Discuss these conflicts frankly.
- Offer/ provide the reasons, which clarify why one is better than the other is.
- See the differences among the team members as the basis for the changes in the team directions.
- Try to break the tension with a friendly manner.

7-When mistakes occur in team work, I usually:

- Make sure of listening feedback and participation.
- Stress on the frankly discussion of our problems during the teamwork.
- Work seriously to provide more useful information.
- Suggest that we purify our basic mission.

8- Dangerous sides which face me when contribute with team work are to:

- Make questions on the related aspects with the team.
- Stimulate the team to focus on the higher performance criteria of work.
- Work outside my defined framework.
- Support the other team member with my point of view according to the way they behave.

10- I think the team problem solving requires me to:

- Cooperate with all team members.
- Have high degree of listening skills.
- Have the willing to ask any kind of question.
- Have a good database.

11- In forming a new team, I usually:

- Try to meet the team members and to know them.
- Focus my questions relating the team goals and the way they work.
- Try to know what the team members will expect from me.
- Make sure of our basic mission clarity.

13- I think the role played by the team leader is to:

- Ensure effective solutions for the work problems.
- Help the team set long and short team goals.
- Create a climate to stimulate the participation in the decision-making process.
- Make a variety of ideas.

14- I think team decisions should be built on:

- The team's goals and mission.
- Having one opinion among the team members.
- A clear and frank assessment of the issues.
- The degree of having evidence to available the issues.

18- According to the other team members, I sometimes get annoyed, as they don't:
- Examine clarify their goals to be sure of the way the achieved them.
- Believe in the importance of working as a group.
- Object the team action that they disagree with.
- Get their teamwork on time.

Autonomy:

Work method autonomy:

1- I have the freedom to determine the way I perform my work.
2- I have the ability to choose the steps and procedures concerning job performance.
3- I'm free to choose the most suitable method to perform my job.

Work schedule autonomy:

1- I'm free to set the job performance schedule.
2- I have some control to determine the consequences of activity performance concerning job.
3- The nature of my work gives me the ability to set the timetable of certain activities performance.

Work criteria autonomy:

1- My work gives me the ability to modify the conservative methods of evaluating our performance, which give me the freedom to concentrate on some work aspects without the other ones.
2- I have the ability to modify the work goals(what I'm supposed to accomplish).
3- I have some control over what I am required to do.

Relative Size:

1- The number of my team members is too small compared with the size of required work to be done.

Team performance:
- Those people whose work is determined by our work often complain about our work.
- Repeated mistakes always happen specially those concerning team performance quality.
- People who interact this team, often complain about the way of performance their work.
- Meanwhile, the team performance and achievement tend to slop down.
- The quality of teamwork is improving over time.
- **Team efficacy:**
- With work and effort, this team can achieve anything required.
- Team goal achievement is in our hands.
- This team can accomplish the required duties without the need to more time and effort.

Team leader Behaviour:

1- The team leader directions are represented in :
   - Taking initiatives to set distinguished levels (standards) and having specialized experience with this team.

- Setting clear goals and purposes for this team.
- Making sure that the team has clear expectations out of the team performance.

2- Team leader coaching:

- The team leader takes initiation to hold meetings to discuss the progress of the team performance.
- The team leader can be consulted at anytime when a problem occurs.
- The team leader is always present, is always reached in case of his absence from the organization.

Team vision:

3- How far do you agree with team objectives?

5-To what extent do you think that the team members will realize clearly the team objectives?

6- to what extent do you think that team objectives can be achieved?

8- How far do you think that the team objectives are useful to the organization?

Team Heterogeneity:

1- There is a great difference in the field of the team members' specialization.
2- There is a variety in experience and the background of my team members.
3- The team members have varieties in their abilities and skills that complete each other.

Team Potency (Spirit):

1- My team members have great confidence in their abilities to perform effectively.
2- My team can accomplish its work in most cases.
3- My team has high spirit.

Team Managerial support:

1- Higher management supports the idea of team work.
2- My boss supports the concept of working in a team.

Team Psychological safety:

1- Team members sometimes reject others who are different.
2- If a mistake happens, it is often against you.
3- No one of my team members intend to let my effort down.
4- It is hard to get help from the team members.
5- There is no fear of risk during the work with a team.
5- My distinguished skills and talents are appreciated during the work with a team.
6- The team members have the ability to discuss critical matters.

Biograhpical Information:

1- Age:

2- Gender:
Male
Female

3- Education Level:

High school
College degree
Post graduate degree

4- Years of experience in the current job
5- Years of experience in team work.

Managers' evaluations (as in the original scales)

1. Team performance

1-Those who receive or use the teams work often complain about it.
2- Critical quality errors occur frequently in this team.
3- Others in the company who interact with this team often complain about how it functions.
4- Recently, this team seems to be slipping a bit in its level of performance and accomplishments.
5-The quality of work provided by this team is improving over time.

2. Team efficacy

1-With focus and effort, this team can do anything we set out to accomplish.
2-This team can achieve its goals.
3-This team can achieve its task without requiring unreasonable time or effort.

Social desirability scale SDS (as in the original scale)

1. I like to gossip at times.
2. There have been occasions when I took advantage of someone.
3. I'm always willing to admit it when I make a mistake.
4. I sometimes try to get even rather than forgive and forget.
5. At times I have really insisted on having things my own way.
6. I have never been irked when people expressed ideas different from my own way.
7. I have never deliberately said something that hurt someone's feelings.

Appendix D

The first version of the questionnaire used in Study One

(Arabic for team members and English for managers' evaluation)

عزيزي المستقصي منه:

تهدف الدراسة التي تقوم بها الباحثة للحصول علي درجة الدكتوراه في إدارة الأعمال إلى تقييم فعالية فرق العمل داخل بعض المنظمات المصرية. وأود أن أحيط سيادتكم علما بأن البيانات التي سيتم الحصول عليها من سيادتكم ستعامل بسريه لأغراض البحث العلمي فقط، وأنه ليس للشركة أو لأي جهة أخري أي علاقة بهذه البيانات. لهذا أرجو من حضراتكم توخي الدقة في الإجابة حيث أنها ستؤثر علي نتائج البحث.

أخيراً أتقدم لسيادتكم بخالص الشكر علي الوقت والجهد الذي ستخصصونه لاستيفاء المطلوب، مما يعد مساهمة فعالة في إنجاز البحث.

مع خالص الشكر

الباحثة: غادة عوض القط

مدرس مساعد بكلية الإدارة والتكنولوجيا
بالأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري .

قائمة الاستقصاء:

يهدف الاستقصاء الحالي إلى دراسة عدد من النقاط المرتبطة بأداء فرق العمل من خلال التعرف علي ثلاث نقاط أساسيه. أولا: نمط أو أسلوب عمل أعضاء الفريق، ثانيا:أداء الفريق، **ثالثا:** عدد من العناصر المرتبطة بفعالية فرق العمل.

الجزء الأول: نمط أو أسلوب عمل أعضاء الفريق:

تقديم:

يهدف الجزء الأول من القائمة إلى التعرف علي نمط أو أسلوب أعضاء الفريق للعمل الجماعي من خلال الإجابة علي بعض العبارات التي تصف أسلوب تعاملهم أثناء العمل في الفريق. و المطلوب منك: تحديد درجة توفر أو عدم توفر تلك العناصر خلال العمل في فريقك في المنظمة، و ذلك بوضع علامة (✓) أمام الخانة المناسبة التي تعبر عن رأيك وفقا للمقياس التالي:

موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
١-خلال اجتماعات الفريق، عادة ما:					
أ. أقدم للفريق معلومات أو بيانات فنية.					
ب. أجعل الفريق يركز علي الأهداف.					
جـ. أتأكد من مشاركة كل الأفراد في المناقشة.					
د. أطرح أسئلة عن أهداف الفريق و طرق تحقيقها.					
٢- بالنسبة لقائد الفريق:					
أ. أقترح أن يكون عملنا ذو هدف محدد.					
ب. أحاول أن أساعده / أساعدها علي بناء مناخ عمل إيجابي.					
جـ. يمكن الاختلاف معه/معها إذا اقتضت الأمور ذلك.					
د. أقدم النصيحة إذا كان ذلك في إطار خبراتي.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٣-عند حدوث تعارض بين أعضاء الفريق:					
أ. أطالب بمناقشة صريحة لهذه الاختلافات.					
ب. أقدم الأسباب التي توضح سبب ترجيح رأي عن الرأي الآخر.					
جـ. أري أن الاختلافات بين أعضاء الفريق يمكن أن تكون الأساس للتغيرات في اتجاهات الفريق.					
د. أحاول كسر حالة الجمود بشكل ودي.					
٤- عندما تحدث أخطاء في عمل الفريق، عادة ما:					
أ. أؤكد علي أهمية الإنصات، المعلومات المرتدة والمشاركة.					
ب. أشجع المناقشات الصريحة لمشاكلنا خلال عمل الفريق.					
جـ. أعمل بشكل جاد لتقديم المزيد من المعلومات المفيدة.					
د. أقترح إعادة النظر في رسالتنا الأساسية.					
٥- الجوانب الخطرة التي تواجهني عند المساهمة في عمل الفريق، تتم حين:					
أ. أطرح تساؤلات عن بعض الجوانب المتعلقة بعمل الفريق.					
ب. أحث الفريق علي تحديد معايير أداء أعلي.					
جـ. أعمل خارج إطار عملي المحدد.					
د. أقدم لأعضاء الفريق الآخر وجهة نظري أو رأيي فيما يتعلق بطريقة تصرفهم.					
٦- أعتقد أن حل مشاكل الفريق تتطلب:					
أ. التعاون بين كل أعضاء الفريق.					
ب. درجه عالية من مهارة الإنصات.					
جـ. الاستعداد لطرح أي نوع من الأسئلة من جانب أعضاء الفريق.					
د. توافر قاعدة بيانات جيدة و واقعية.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٧- عندما يشكل فريق جديد، عادة ما:					
أ. أحاول مقابلة أعضاء الفريق و التعرف عليهم.					
ب. اطرح اسئلة محددة تتعلق بأهداف الفريق وطرق عمله.					
جـ. أحاول معرفة ما يتوقعه أفراد الفريق مني.					
د. أسعى للتأكيد علي وضوح رسالتنا الأساسية لجميع الأعضاء.					
٨- أعتقد أن دور قائد الفريق هو:					
أ. التأكيد علي تبني حلول فعاله لمشاكل العمل.					
ب. مساعدة الفريق علي تحديد الأهداف طويلة وقصيرة الأجل.					
جـ. خلق مناخ يحفز علي المشاركة في عملية اتخاذ القرارات.					
د. العمل علي تنويع الأفكار والتطرق لأي احتمالات مقترحه.					
٩-أعتقد أن قرارات الفريق يجب أن تبني علي:					
أ. رسالة الفريق وأهدافه.					
ب. وجود إجماع بين أعضاء الفريق.					
جـ. وجود تقييم صريح وواضح للقضايا المطروحة.					
د. النظر إلى الدلائل المتاحة والمتوفرة لدي الفريق.					
١٠- بالنسبة لأعضاء الفريق الآخر، أحيانا أشعر بالضيق لأنهم لا :					
أ. يقومون بتنقيح أهدافهم للتحقق من مدي إنجازهم.					
يؤمنون بأهمية العمل الجماعي.					
جـ. يعارضون قرارات الفريق التي لا يتفقون معها.					
د. يقومون بأداء واجبات الفريق في الوقت المحدد.					

الجزء الثاني : أداء الفريق:

تقديم:

يهدف الجزء الثاني من القائمة إلى التعرف علي أداء الفريق من خـــلال إجابـــة علي بعض العبارات المرتبطة بأداء الفريق لمهام العمل. **والمطلوب منك تحديـــد درجـــة** صحة أو دقة هذه العبارات فـــي الـــواقـــع العملي في فريقـــك الحالـــي، وذلك بوضـــع علامة (✓) أمام الخانة المناسبة التي تعبر عن رأيك وفقا للمقياس التالي:

العبارة دقيقه جدا	العبارة دقيقه	لا أعرف	العبارة غير دقيقة	العبارة غير دقيقه علي الإطلاق

العبارات	العبارة دقيقة جـداً	العبارة دقيقة	لا أعرف	العبارة غير دقيقة	العبارة غير دقيقة على الإطلاق
١- أداء الفريق:					
أ. الأفراد الذين يتوقف عملهم علي العمل الذي نقوم به داخل المنظمة غالبا يشتكون من عملنا في الفريق.					
ب. دائما ما تحدث أخطاء متكررة تتعلق بجودة أداء الفريق.					
جـــ. الأفراد الذين يتفاعلون مع هذا الفريق غالبا ما يشتكون من كيفية أداءه لعمله.					
د. في الأونة الأخيرة، يميل أداء الفريق للانخفاض.					
و. جودة عمل الفريق في تحسن مستمر.					
٢- فعالية الفريق:					
أ. بالعمل والجهد، هذا الفريق يمكنه تحقيق أي شيء مطلوب تنفيذه.					
ب. تحقيق أهداف الفريق في متناول أيدينا.					
جـــ. هذا الفريق يمكنه تحقيق الواجبات المطلوب أدائها دون الحاجة لأي وقت أو جهد مبالغ فيه.					

الجزء الثالث :عناصر أخري مرتبطة بفعالية فرق العمل:

تقديم:

يهـدف الجـزء الثالث من القائمة إلى التعرف علي بعض العناصر التي تسـهم في فعالية فرق العمل من خلال الإجابة علي بعض العبارات التي تؤثر في نجاح أو فشـل، أداء فرق العمل. **والمطلوب منك: تحديد درجة توفر أو عدم توفر تلك العنـاصر خـلال العمل في فريقك في المنظمة**، وذلك بوضع علامة (✓) أمام الخانة المناسبة التـي تعـبر عن رأيك وفقا للمقياس الموضح أمام كل عنصر.

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
١- الاستقلالية:					
▫ الاستقلالية في طريقة العمل:					
١- لدي الحرية في تحديد طريقة أداء عملي (الطريقة التي تستخدم).					
٢. لدى القدرة لاختيار الخطوات والإجراءات الخاصة بأداء العمل.					
٣- لدي الحرية في اختيار الأسلوب الملائم لأداء العمل.					
▫ الاستقلالية في العمل:					
١- لدي الحرية في تحديد جدوله أداء عملي (تنظيم المواعيد).					
٢- لدى بعض الحرية في تحديد تتابع أداء الأنشطة المتعلقة بعملي.					
٣- طبيعة عملي تتيح لي القدرة علي تحديد توقيتات أداء أنشطة معينه.					
▫ الاستقلالية في تحديد معايير أداء العمل:					
١- عملي يتيح لي القدرة علي تعديل الطريقة النمطية لتقييم أدائنا مما يتيح لي الحرية في التركيز علي بعض من جوانب العمل دون الجوانب الأخري					
٢- لدي القدرة على تعديل أهداف العمل (ما يفترض علىّ أداءه).					
٣- لدي بعض القدرة علي تحديد ما يطلب مني أداء ي العمل(ما يراه مشرفي كأساس لتحقيق هدف العمل).					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٢- حجم الفريق: عدد افراد فريقي صغير جدا مقارنة بحجم العمل المطلوب أداؤه.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٣- مناخ عمل المنظمة: أ- ما مدي اتفاقك مع أهداف الفريق؟					
٢- إلى أي مدي تعتقد أن أعضاء الفريق يدركون أهداف الفريق بوضوح؟					
٣- إلى أي مدي تعتقد أن أهداف الفريق يمكن فعلا تحقيقها؟					
٤- إلى أي مدي تعتقد أن أهداف الفريق مفيدة للمنظمة ككل؟.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض..	أعترض بشدة
٤- اتساق أعضاء الفريق: أ. يوجد تباين شديد في مجالات تخصص أعضاء فريقي.					
ب. يوجد تنوع في خبرات و خلفيات أعضاء فريقي.					
جـ. يتمتع أعضاء فريقي بتنوع قدراتهم ومهاراتهم بحيث يمكنهم أن يكملون بعضهم البعض.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٥- الروح المعنوية:					
أ. أعضاء فريقي لديهم ثقة عالية في قدرتهم على الأداء بفعالية.					
ب. يستطيع فريقي إتمام أي واجبات تسند إليه في معظم الأحوال.					
جـ. يتمتع فريقي بروح معنوية عالية.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٦-دعم الإدارة العليا:					
أ. الإدارة العليا في المنظمة تدعم فكرة العمل كفريق.					
ب. رئيسي يؤيد فكرة العمل في فريق.					

العبارات	دائماً	غالباً	أحياناً	نادراً	أبداً
٧-قائد الفريق:					
اتجاه قائد الفريق يتمثل في:					
أ. قائد الفريق يأخذ بزمام المبادرة لبناء مستوي متميز ولديه خبرة تخصصيه في هذا الفريق.					
ب. قائد الفريق يضع أهداف و أغراض محددة للفريق.					
جـ قائد الفريق يتأكد من أن الفريق لديه توقعات واضحة عن أداءه.					
□ التوجيه:					
١ قائد الفريق لديه المبادرة لعقد اجتماعات لمناقشة مدي تقدم أداء الفريق.					
٢ يمكن استشارة قائد الفريق في أي وقت عند حدوث أية مشكله.					
٣ قائد الفريق دائما متواجد حتى في حالة عدم وجوده داخل المنظمة (يمكن الاتصال به دائما).					

العبارات	العبارة دقيقة جـداً	العبارة دقيقة	لا أعرف	العبارة غير دقيقة	العبارة غير دقيقة على الإطلاق
٨- الأمان:					
١- أحيانا ما يرفض أعضاء الفريق وجود أعضاء آخرين مختلفين عنهم.					
٢- إذا ارتكبت خطا ما، فانه غالبا ما يحسب ضدك.					
٣- لا يتعمد أحد من أعضاء الفريق التقليل من جهدي.					
٤- يصعب طلب المساعدة من أعضاء الفريق.					
٥- لا يوجد خوف من المخاطرة أثناء العمل مع الفريق.					
٦- يتم تقدير مهاراتي ومواهبي المتميزة من خلال العمل مع أعضاء الفريق.					
٧- أعضاء الفريق لديهم القدرة علي طرح المشاكل والمسائل الحرجة ومناقشتها.					

بيانات أخرى:

١- السن: .....

٢- النوع:

ذكر ☐

أنثى ☐

٣- المستوى التعليمي:

أقل من الجامعي.....

جامعي :.....

بعد الجامعي :.....

٤- الوظيفة الحالية:.....

٥- الإدارة أو القسم الذي تعمل به:.....

.....

.....

٦- سنوات الخبرة في الوظيفة الحالية:.....

.....

.....

٧- فترة العمل في الوظيفة الحالية:.....

.....

٨- فترة عملك فى فرق عمل أخرى أن وُجد:.....

أذكرها إن وُجد .....

.....

مع خالص الشكر

Managers' evaluation:

The aim of that questionnaire is to evaluate the team in your organisation from the managers' point of view. Please, be sure of your answer that will affect the result of my PhD study. This information will be for research use only.

Part 1:Team evaluation

The aim of this part is to evaluate the teams from their managers' point of view. Please indicate which one of the following related to the team that you are supervise with the following scale:

Strongly agree	Agree	Natural	Disagree	Strongly disagree

Team Title:
Team Number:

1- Team Performance (For each team)

Statements	Strongly Agree	Agree	Natural	Disagree	Strongly disagree
1-Those who receive or use the teams work often complain about it.					
2- Critical quality errors occur frequently in this team.					
3- Others in the company who interact with this team often complain about how it functions.					
4- Recently, this team seems to be slipping a bit in its level of performance and accomplishments.					
5-The quality of work provided by this team is improving over time.					

2-Team Efficacy (For each team)

Statements	Strongly Agree	Agree	Natural	Disagree	Strongly disagree
1-With focus and effort, this team can do anything we set out to accomplish.					
2-This team can achieve its goals.					
3-This team can achieve its task without requiring unreasonable time or effort.					

Appendix E

The teams numbers in Study One

Teams	Serial number
Work affairs	1
Public relations	2
Recruitment	3
Purchasing	4
Local purchase	5
Foreign purchase	6
Raw material purchase	7
Control inventory purchase	8
Computer	9
Safety	10
Co-ordination	11
Training	12
Sales	13
Growth	14
Cost	15
Budget	16
Auditing	17
Accountant	18
Machine and supply purchase	19

Appendix F

The second version of the questionnaire used in Study Two

(Arabic for team members and English for managers' evaluation)

عزيزي المستقصي منه:

تهدف الدراسة التي تقوم بها الباحثة للحصول علي درجة الدكتوراه في إدارة الأعمال إلى تقييم فعالية فرق العمل داخل بعض المنظمات المصرية. وأود أن أحيط سيادتكم علما بأن البيانات التي سيتم الحصول عليها من سيادتكم ستعامل بسريه لأغراض البحث العلمي فقط، وأنها بدون أسماء، فضلا عن انه ليس للشركة أو لأي جهة أخري أي علاقة بهذه البيانات. لهذا أرجو من حضراتكم توخي الدقة في الإجابة حيث أنها ستؤثر علي نتائج البحث.

أخيراً أتقدم لسيادتكم بخالص الشكر علي الوقت والجهد الذي ستخصصونه لاستيفاء المطلوب، مما يعد مساهمة فعالة في إنجاز البحث.

مع خالص الشكر

الباحثة: غادة عوض القط

مدرس مساعد بكلية الإدارة والتكنولوجيا

بالأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري

قائمة الاستقصاء:

يهدف الاستقصاء الحالي إلى دراسة عدد من النقاط المرتبطة بأداء فرق العمل من خلال التعرف علـي ثلاث نقاط أساسيه. **أولا:** نمط أو أسلوب عمل أعضاء الفريق، **ثانيا:** تقدير أداء الفريق، **ثالثا:** عدد من العناصر المرتبطة بفعالية فرق العمل.

الجزء الأول: نمط أو أسلوب عمل أعضاء الفريق:

تقديم:

يهدف الجزء الأول من القائمة إلى التعرف علي نمط أو أسلوب أعضاء الفريق للعمل الجمـاعي مـن خلال الإجابة علي بعض العبارات التي تصف أسلوب تعاملهم أثناء العمل في الفريق. **و المطلوب منك: تحديـد درجة توفر أو عدم توفر تلك العناصر خلال العمل في فريقك في المنظمة،** و ذلك بوضع علامة (✓) أمام الخانة المناسبة التي تعبر عن رأيك وفقا للمقياس التالي:

موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
١-خلال اجتماعات الفريق، عادة ما:					
أ. أقدم للفريق معلومات أو بيانات فنية.					
ب. أجعل الفريق يركز علي الأهداف.					
جـ. أتأكد من مشاركة كل الأفراد في المناقشة.					
د. أطرح أسئلة عن أهداف الفريق و طرق تحقيقها.					
٢- بالنسبة لقائد الفريق:					
أ. أقترح أن يكون عملنا ذو هدف محدد.					
ب. أحاول أن أساعده / أساعدها علي بناء مناخ عمل ايجابي.					
جـ. يمكن الاختلاف معه/معها إذا اقتضت الأمور ذلك.					
د. أقدم النصيحة إذا كان ذلك في إطار خبراتي.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٣-عند حدوث تعارض بين أعضاء الفريق:					
أ. أطالب بمناقشة صريحة لهذه الاختلافات.					
ب. أنعم الأسباب التي توضح سبب ترجيح رأي عن الرأي الآخر.					
جـ. أري أن الاختلافات بين أعضاء الفريق يمكن أن تكون الأساس للتغيرات في اتجاهات الفريق.					
د. أحاول كسر حالة الجمود بشكل ودي.					
٤- عندما تحدث أخطاء في عمل الفريق، عادة ما:					
أ. أؤكد علي أهمية الإنصات، المعلومات المرتدة والمشاركة.					
ب. أشجع المناقشات الصريحة لمشاكلنا خلال عمل الفريق.					
جـ. أعمل بشكل جاد لتقديم المزيد من المعلومات المفيدة.					
د. أقترح إعادة النظر في رسالتنا الأساسية.					
٥- الجوانب الخطرة التي تواجهني عند المساهمة في عمل الفريق، تتم حين:					
أ. أطرح تساؤلات عن بعض الجوانب المتعلقة.					
ب. أحث الفريق علي تحديد معايير أداء أعلي.					
جـ. أعمل خارج إطار عملي المحدد.					
د. أقنم لأعضاء الفريق الآخر وجهة نظري أو رأيي فيما يتعلق بطريقة تصرفهم.					
٦- أعتقد أن حل مشاكل الفريق تتطلب:					
أ. التعاون بين كل أعضاء الفريق.					
ب. درجه عالية من مهارة الإنصات.					
جـ. الاستعداد لطرح أي نوع من الأسئلة من جانب.أعضاء الفريق.					
د. توافر قاعدة بيانات جيدة و واقعية.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٧- عندما يشكل فريق جديد، عادة ما:					
أ. أحاول مقابلة أعضاء الفريق و التعرف عليهم.					
ب. أطرح أسئله محددة تتعلق بأهداف الفريق وطرق عمله.					
جـ. أحاول معرفة ما يتوقعه أفراد الفريق مني.					
د. أسعى للتأكيد علي وضوح رسالتنا الأساسية لجميع الأعضاء.					
٨- أعتقد أن دور قائد الفريق هو:					
أ. التأكيد علي تبني حلول فعاله لمشاكل العمل.					
ب. مساعدة الفريق علي تحديد الأهداف طويلة وقصيرة الأجل.					
جـ. خلق مناخ يحفز علي المشاركة في عملية اتخاذ القرارات.					
د. العمل علي تنويع الأفكار والتطرق لأي احتمالات مقترحه.					
٩-أعتقد أن قرارات الفريق يجب أن تبني علي:					
أ. رسالة الفريق وأهدافه.					
ب. وجود إجماع بين أعضاء الفريق.					
جـ. وجود تقييم صريح وواضح للقضايا المطروحة.					
د. النظر إلى الدلائل المتاحة والمتوفرة لدي الفريق.					
١٠- بالنسبة لأعضاء الفريق الآخر، أحيانا أشعر بالضيق لأنهم لا :					
أ. يقومون بتنقيح أهدافهم للتحقق من مدي إنجازهم.					
ب. يؤمنون بأهمية العمل الجماعي.					
جـ. يعارضون قرارات الفريق التي لا يتفقون معها.					
د. يقومون بأداء واجبات الفريق في الوقت المحدد.					

الجزء الثاني : أداء الفريق:

تقديم:

يهدف الجزء الثاني من القائمة إلى التعرف علي أداء الفريق من خلال الإجابة علي بعض العبارات المرتبطة بأداء الفريق لمهام العمل. **والمطلوب منك تحديد درجة صحة أو دقة هذه العبارات في الواقع العملي في فريقك الحالي**، وذلك بوضع علامة (✓) أمام الخانة المناسبة التي تعبر عن رأيك وفقا للمقياس التالي:

العبارة دقيقه جدا	العبارة دقيقه	لا أعرف	العبارة غير دقيقة	العبارة غير دقيقه علي الإطلاق

العبارات	العبارة دقيقة جداً	العبارة دقيقة	لا أعرف	العبارة غير دقيقة	العبارة غير دقيقة على الإطلاق
١- أداء الفريق:					
أ. الأفراد الذين يتوقف عملهم علي العمل الذي نقوم به داخل المنظمة غالبا يشتكون من عملنا في الفريق.					
ب. دائما ما تحدث أخطاء متكررة تتعلق بجودة أداء الفريق.					
جـ. الأفراد الذين يتفاعلون مع هذا الفريق غالبا ما يشتكون من كيفية أداءه لعمله.					
د. في الآونة الأخيرة، يميل أداء الفريق للانخفاض.					
و. جودة عمل الفريق في تحسن مستمر.					
٢- فعالية الفريق:					
أ. بالعمل والجهد، هذا الفريق يمكنه تحقيق أي شيء مطلوب منه.					
ب. تحقيق أهداف الفريق في متناول أيدينا.					
جـ. هذا الفريق يمكنه تحقيق الواجبات المطلوب أدائها دون الحاجة لأي وقت أو جهد مبالغ فيه.					

الجزء الثالث :عناصر أخري مرتبطة بفعالية فرق العمل:

تقديم:

يهـدف الجـزء الثالث من القائمة إلى التعرف علي بعض العناصر التي تسهم في فعالية فرق العمـل من خلال الإجابة علي بعض العبارات التي تؤثر في نجاح أو فشل أداء فرق العمل. **والمطلوب منك: تحديد درجة توفر أو عدم توفر تلك العناصر خلال العمل في فريقك في المنظمة**، وذلك بوضع علامـة (✓) أمـام الخانـة المناسبة التي تعبر عن رأيك وفقا للمقياس الموضح أمام كل عنصر.

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
١- الاستقلالية: □ الاستقلالية في طريقة العمل: ١- لدي الحرية في تحديد طريقة أداء عملي (الطريقة التي تستخدم). ٢. لدى القدرة لاختيار الخطوات والإجراءات الخاصة بأداء العمل. ٣- لدي الحرية في اختيار الأسلوب الملائم لأداء العمل.					
□ الاستقلالية في العمل: ١- لدي الحرية في تحديد جدوله أداء عملي (تنظيم المواعيد).					
٢- لدى بعض الحرية في تحديد تتابع أداء الأنشطة المتعلقة بعملي.					
٣- طبيعة عملي تتيح لي القدرة علي تحديد توقيتات أداء أنشطة معينه.					
□ الاستقلالية في تحديد معايير أداء العمل: ١- عملي يتيح لي القدرة علي تعديل الطريقة النمطية لتقييم أدائنا مما يتيح لي الحرية في التركيز علي بعض من جوانب العمل دون الجوانب الأخرى					
٢- لدي القدرة على تعديل أهداف العمل (ما يفترض علىّ أداءه).					
٣- لدي بعض القدرة علي تحديد ما يطلب مني أداءه في العمل(ما يراه مشرفي كأساس لتحقيق هدف العمل).					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٢- حجم الفريق: عدد أفراد فريقي صغير جدا مقارنة بحجم العمل المطلوب أداؤه.					

العبارات	موافق بشدة	موافق	لا أعرف	أعترض	أعترض بشدة
٣- علاقات داخليه مع الفريق: ١. ما مدي اتفاقك مع أهداف الفريق؟					
٢. إلى أي مدي تعتقد أن أعضاء الفريق يدركون أهدافا لفريق بوضوح؟					
٣. إلى أي مدي تعتقد أن أهداف الفريق يمكن فعلا تحقيقها؟					
٤. إلى أي مدي تعتقد أن أهداف الفريق مفيدة للمنظمة ككل؟.					
٥. يوجد تباين شديد في مجالات تخصص أعضاء فريقي.					
٦. يوجد تنوع في خبرات و خلفيات أعضاء فريقي.					
٧. يتمتع أعضاء فريقي بتنوع قدراتهم ومهاراتهم بحيث يمكنهم أن يكملون بعضهم البعض.					
٨. أعضاء فريقي لديهم ثقة عالية في قدرتهم علي الأداء بفعالية.					
٩. يستطيع فريقي إتمام أي واجبات تسند إليه في معظم الأحوال.					
١٠. يتمتع فريقي بروح معنوية عالية.					

العبارات	موافق بشدة	موافق	لأعرف	أعترض	اعترض بشده
٤. نواحي اداريه:					
ا. الإدارة العليا في المنظمة تدعم فكرة العمل كفريق.					
ب. رئيسي يؤيد فكرة العمل في فريق.					
٥. اتجاه قائد الفريق يتمثل في:					
أ. قائد الفريق يأخذ بزمام المبادرة لبناء مستوي متميز ولديه خبرة تخصصيه في هذا الفريق.					
ب. قائد الفريق يضع أهداف و أغراض محددة للفريق.					
جـ. قائد الفريق يتأكد من أن الفريق لديه توقعات واضحة عن أداءه.					
د . قائد الفريق لديه المبادرة لعقد اجتماعات لمناقشة مدي تقدم أداء الفريق.					
ه. يمكن استشارة قائد الفريق في أي وقت عند حدوث أية مشكله.					
و. قائد الفريق دائما متواجد حتي في حالة عدم وجوده داخل المنظمة (يمكن الاتصال به دائما).					
٦.الامان: ١. أحيانا ما يرفض أعضاء الفريق وجود أعضاء آخرين مختلفين عنهم.					
ب. إذا ارتكبت خطا ما، فانه غالبا ما يحسب ضدك					
ج. لا يتعمد أحد من أعضاء الفريق التقليل من جهدي.					
د. يصعب طلب المساعدة من أعضاء الفريق.					
ه. لا يوجد خوف من المخاطرة أثناء العمل مع الفريق.					
و. يتم تقدير مهاراتي ومواهبي المتميزة من خلال العمل مع أعضاء الفريق.					
ز. أعضاء الفريق لديهم القدرة علي طرح المشاكل و المسائل الحرجه ومناقشتها.					

العبارات	صحيحه	خطأ
٧. رد الفعل تجاه العمل مع الغير:		
ا. احب الثرثره مع زملائي في وقت العمل.		
ب. احيانا احاول استغلال الاخرين.		
ج. انني علي استعداد دائم للاعتراف بالخطأ في حال ارتكابه		
د. افضل في بعض الاحيان عدم التسامح او النسيان و معامله الاخرين بالمثل.		
ه. في احيان كثيره اصر علي تناول امور العمل وفقا لطريقتي الخاصه.		
و. لاأغضب ابدا اذا كانت اراء الاخرين مختلفه عن رايي.		
ز. لا اتعمد ابدا اهانه مشاعر الاخرين.		

بيانات أخرى:

١- السن:

٢- النوع:

ذكر ☐

أنثى ☐

٣- المستوى التعليمي:

أقل من الجامعي: .....

جامعي : .....

بعد الجامعي : .....

٤- الوظيفة الحالية: .....

٥- الإدارة أو القسم الذي تعمل به: .....

٦- سنوات الخبرة في الوظيفة الحالية: .....

٧- فترة عملك فى فرق عمل أخرى أن وُجد: .....

أذكرها إن وجد .....

مع خالص الشكر

Managers' evaluation:

The aim of that questionnaire is to evaluate the team in your organisation from the managers' point of view. Please, be sure of your answer that will affect the result of my PhD study. This information will be for research use only.

Part 1:Team evaluation

The aim of this part is to evaluate the teams from their managers' point of view. Please indicate which one of the following related to the team that you are supervise with the following scale:

Strongly agree	Agree	Natural	Disagree	Strongly disagree

Team Title:
Team Number:

1- Team Performance (For each team)

Statements	Strongly Agree	Agree	Natural	Disagree	Strongly disagree
1-Those who receive or use the teams work often complain about it.					
2- Critical quality errors occur frequently in this team.					
3- Others in the company who interact with this team often complain about how it functions.					
4- Recently, this team seems to be slipping a bit in its level of performance and accomplishments.					
5-The quality of work provided by this team is improving over time.					

2-Team Efficacy (For each team)

Statements	Strongly Agree	Agree	Natural	Disagree	Strongly disagree
1-With focus and effort, this team can do anything we set out to accomplish.					
2-This team can achieve its goals.					
3-This team can achieve its task without requiring unreasonable time or effort.					

Appendix G

Balanced and non-balanced teams in Study Two

Team No.	Con	Coll	Com	Chall	Higher Con	Higher coll	Higher com	Higher chall	Total	Balanced team (1) or non-balanced teams (0)
1	4.35	4.27	4.35	4.28	1	1	1	1	4	1
2	4.40	4.20	4.10	4.10	1	1	1	1	4	1
3	4.35	4.28	4.35	4.28	1	1	1	1	4	1
4	4.35	4.20	3.95	4.05	1	1	0	1	3	0
5	4.17	4.43	4.13	4.13	1	1	1	1	4	1
6	4.30	4.28	4.24	4.20	1	1	1	1	4	1
7	4.30	4.15	4.20	4.40	1	1	1	1	4	1
8	4.35	4.32	4.22	4.38	1	1	1	1	4	1
9	3.90	3.78	4.10	3.96	0	0	1	0	1	0
10	4.30	4.12	4.02	4.10	1	1	1	1	4	1
11	4.28	4.26	4.06	4.10	1	1	1	1	4	1
12	4.22	3.86	3.98	4.00	1	0	0	1	2	0
13	4.25	4.07	3.95	4.10	1	1	0	1	3	0
14	4.22	4.20	3.78	4.12	1	1	0	1	3	0
15	4.20	4.15	4.10	4.22	1	1	1	1	4	1
16	4.06	4.23	4.26	4.13	1	1	1	1	4	1
17	4.16	4.02	4.06	4.26	1	1	1	1	4	1
18	3.95	3.75	3.75	3.85	0	0	0	0	0	0
19	4.45	4.30	4.35	4.27	1	1	1	1	4	1
20	4.35	4.30	4.27	4.37	1	1	1	1	4	1
21	4.30	4.00	3.92	4.25	1	1	0	1	3	0
22	4.34	3.92	4.04	3.80	1	0	1	0	2	0
23	4.26	3.93	4.23	4.20	1	0	1	1	3	0
24	3.90	4.10	3.87	3.90	0	1	0	0	1	0
25	4.38	4.40	4.46	4.38	1	1	1	1	4	1
26	4.10	3.90	3.97	4.10	1	0	0	1	2	0
27	4.35	4.30	4.35	4.45	1	1	1	1	4	1
28	4.18	4.16	4.08	4.23	1	1	1	1	4	1
29	4.15	4.22	4.27	4.12	1	1	1	1	4	1
30	3.90	3.83	3.83	4.06	0	0	0	1	1	0
31	4.12	4.22	4.06	4.02	1	1	1	1	4	1

Team No.	Con	Coll	Com	Chall	Higher Con	Higher coll	Higher com	Higher chall	Total	Balanced team (1) or non-balanced teams (0)
32	3.97	3.82	3.85	4.05	0	0	0	1	1	0
33	4.31	4.26	4.21	4.33	1	1	1	1	4	1
34	4.20	3.88	4.10	4.10	1	0	1	1	3	0
35	4.54	4.24	4.22	4.26	1	1	1	1	4	1
36	3.60	3.73	3.83	3.83	0	0	0	0	0	0
37	4.22	4.16	4.38	4.38	1	1	1	1	4	1
38	4.25	4.35	4.27	4.45	1	1	1	1	4	1
39	4.20	4.14	4.04	4.38	1	1	1	1	4	1
40	4.20	4.14	4.04	4.38	1	1	1	1	4	1
41	4.00	4.00	4.10	4.00	1	1	1	1	4	1
42	4.06	3.88	3.95	4.05	1	0	0	1	2	0
43	4.20	4.30	4.28	4.44	1	1	1	1	4	1
44	4.37	4.24	4.20	4.20	1	1	1	1	4	1
45	4.08	4.00	4.08	4.06	1	1	1	1	4	1
46	4.14	4.08	4.12	4.12	1	1	1	1	4	1
47	4.32	4.24	4.28	4.38	1	1	1	1	4	1
48	4.22	4.20	4.10	4.28	1	1	1	1	4	1
49	4.00	4.08	4.16	4.03	1	1	1	1	4	1
50	4.12	4.18	3.92	4.06	1	1	0	1	3	0
51	4.02	3.92	4.00	4.02	1	0	1	1	3	0
52	4.28	4.18	4.15	4.40	1	1	1	1	4	1
53	4.21	4.16	4.15	4.21	1	1	1	1	4	1
54	4.31	4.14	4.30	4.35	1	1	1	1	4	1
55	4.14	4.28	4.21	4.34	1	1	1	1	4	1
56	4.10	4.40	4.35	4.20	1	1	1	1	4	1
57	4.42	4.47	4.27	4.35	1	1	1	1	4	1
58	4.36	4.03	3.96	4.00	1	1	0	1	3	0
59	3.92	4.17	4.02	4.20	0	1	1	1	3	0
60	4.00	4.50	3.80	4.02	1	1	0	1	3	0
61	4.25	4.12	4.12	4.05	1	1	1	1	4	1
62	4.20	4.10	4.32	4.27	1	1	1	1	4	1

Team No.	Con	Coll	Com	Chall	Higher Con	Higher coll	Higher com	Higher chall	Total	Balanced team (1) or non-balanced teams (0)
63	4.22	4.36	4.40	4.28	1	1	1	1	4	1
64	4.14	4.22	4.18	4.12	1	1	1	1	4	1
65	4.26	4.32	4.28	4.38	1	1	1	1	4	1
66	4.20	4.17	4.12	4.25	1	1	1	1	4	1
67	4.00	4.10	4.20	4.04	1	1	1	1	4	1
68	4.16	4.16	4.13	4.18	1	1	1	1	4	1
69	4.25	4.10	4.20	4.07	1	1	1	1	4	1
70	4.26	4.26	4.10	4.14	1	1	1	1	4	1
71	4.37	4.30	4.27	4.22	1	1	1	1	4	1
72	4.28	4.18	4.16	4.36	1	1	1	1	4	1
73	4.12	4.05	4.00	4.17	1	1	1	1	4	1
74	4.35	4.22	4.40	4.40	1	1	1	1	4	1
75	4.22	4.04	4.14	4.22	1	1	1	1	4	1
76	4.26	4.32	4.28	4.38	1	1	1	1	4	1
77	4.00	4.12	4.12	4.25	1	1	1	1	4	1
78	4.16	4.42	4.32	4.28	1	1	1	1	4	1
79	4.41	4.43	4.30	4.40	1	1	1	1	4	1
80	4.36	4.10	4.18	4.22	1	1	1	1	4	1
81	4.14	4.08	4.12	4.12	1	1	1	1	4	1
82	4.32	4.00	4.28	4.38	1	1	1	1	4	1
83	4.02	4.26	4.12	4.24	1	1	1	1	4	1
84	4.03	4.06	4.10	4.23	1	1	1	1	4	1
85	4.10	4.18	4.18	4.18	1	1	1	1	4	1
86	4.28	4.34	4.20	4.32	1	1	1	1	4	1

Balanced teams.

Con, Coll, com and Chall = the mean of each style (M).
The re-coded variables are: Higher con higher coll, higher com and higher chall (that indicated the balance of each style)
Total = the sum of the four styles in each team. Balanced team =1, Non-balanced team=0.

Appendix H

Published paper

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Comparative study of cognitive styles in Egypt, Greece, Hong Kong and the UK

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Cognitive style has been described as consistent individual differences in the organising and processing of information. It is has been argued that it is an important factor in managerial learning and cognition. A number of authors have suggested that groups from different national cultures are likely to exhibit style differences and that this has important implications for management training and development. In the present study, which employed closely matched samples of business and management undergraduates from Egypt, Greece and the UK, there were no statistically significant differences in style. However, in post-graduate samples from Egypt, Hong Kong and the UK that were less closely matched, statistically significant differences were observed. Comparison of these data with those from other studies suggests that amongst undergraduates from a variety of national cultures there do not appear to be significant differences in style. Among post-graduates and managers the picture that emerges was more equivocal and the extent to which any observed differences are artefacts of sampling and method remains unclear. The implications of the findings for style theory and management education, training and development are discussed.

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Introduction

A number of authors have argued that national culture may be related to individual differences in cognitive style (Abramson *et al.*, 1996) and that such differences may be important in a business environment in which managers are required to communicate and operate globally and in a management education environment that is becoming increasingly internationalised (Allinson and Hayes, 2000). If such differences do exist, they may be one factor that impinges upon the effectiveness of interactions between managers from different national cultures in both work and educational settings. For example, Adler *et al.* (1986) argued that problems of understanding and predicting behaviour might arise from a lack of appreciation of the thought processes of managers from different national cultures. Abramson *et al.* (1993) noted the need for cross-cultural research that compares cognitive styles. Using a sample of business and management post-graduates and undergraduates, this study aimed to explore cross-national differences in style in Egypt, Greece, Hong Kong and the UK. It aimed to test the assertion, made by a number of researchers, that there are likely to be cross-national differences in preferred ways of organising and processing information (cognitive styles) and wanted to consider the implications for style theory and management education, training and development.

Cognitive style

Cognitive style may be described as consistent individual differences in preferred ways of organising and processing information (Messick, 1984: 143) and is usually considered to be the antecedent of learning style (Curry, 1983; Riding, 1997). There are a variety of theories of cognitive style (Hayes and Allinson, 1994; Riding and Cheema, 1991). For example, Riding (1997) argued that there are two orthogonal style constructs that he termed the verbaliser-imager and wholist-analytical dimensions and which may be assessed using a computer-administered direct test of cognitive processing (the Cognitive Styles Analysis, CSA). Allinson and Hayes (1996) argued in favour of a single style dimension, which they termed intuition-analysis that affects how individuals organise and process information in a range of learning, problem-solving and decision-making situations. Within this theory analysts prefer to pay attention to detail, focus on 'hard data' and adopt sequential, step-by-step approaches that depend on systematic methods of investigation. Intuitives, on the other hand, are less concerned with detail, adopt a global perspective and an open-ended approach to problem solving, they emphasise synthesis and the simultaneous integration of many inputs at the same time and pay more attention to feelings. Allinson and Hayes (1996) reported the development of a measure – the Cognitive Style Index (CSI) – a 38-item self-report inventory. CSI scores have been shown to correlate with a variety of learning and workplace behaviours (see, for example, Armstrong *et al.*, 1997; Sadler-Smith *et al.*, 2000a). The instrument's authors also asserted that style is related to gender, with females (contrary to the stereotype of 'female intuition') being more analytical than males (Allinson and Hayes, 1996). A comparison by Sadler-Smith, Spicer and Tsang (2000b) of scores on the CSA and CSI revealed a Pearson Product Moment correlation of virtually zero ($r = 0.05$) between analysis-intuition and wholist-analytical styles.

Cognitive style and national culture

Sternberg (1997: 99) argued that national culture might be one of several variables (the others include gender, age, parenting, schooling and occupation) that are likely to affect the development of thinking styles. Allinson and Hayes (2000), in support of this notion, argued that there are cross-cultural differences in cognitive style and that these may be fundamental obstacles to productive working relationships

between managers of different national cultures. They used Hickson and Pugh's model of national culture which comprises a series of groupings, for example, North Europeans (Germany, Sweden, Finland, etc.), Anglos (UK, USA, Canada, etc.) and Latins (France, Italy, Portugal, etc.). Their study employed a sample, which comprised 394 managers and 360 undergraduate management students. Among managers they found that UK respondents were more analytical (higher CSI scores) than their counterparts in India, Jordan, Nepal, Russia and Singapore. For the management students sub-sample they conducted separate one-way analyses of variance for males and females. For the males they found that German respondents (Northern European) were more analytical than their UK counterparts, while for the females they found that UK respondents were more analytical than their French (Latin) or Australian (Anglo) counterparts ($F = 2.24$, df = 3, 161, $p < 0.05$ and $F = 2.76$, df = 4, 190, $p < 0.05$, respectively). Overall, they concluded that the most analytical groups were located in what they termed the 'Developing Countries and Arab categories' (Allinson and Hayes, 2000: 161), while the most intuitive were in the Anglo, North European and European Latin groups. Greek national culture is not discussed explicitly in the model presented by Hickson and Pugh, but we suggest it would perhaps be somewhere in between the East-Central European and the Latin groups and hence may indicate that Greek and UK management students are likely to differ in their cognitive styles. In later research using the CSI Sadler-Smith, Spicer and Tsang (2000b) observed statistically significant differences in styles between owner managers from Hong Kong and the UK (the Hong Kong sample were more analytical than their UK counterparts).

An alternative to Hickson and Pugh's framework is the model of national culture proposed by Hofstede (1980, 1991). Hofstede (1980) operationalised culture and its associated values into four dimensions based upon research among employees of IBM in various countries throughout the world. The four dimensions that he identified were power distance, collectivism-individualism, uncertainty avoidance and masculinity–femininity. Power distance refers to the extent to which members of a national cultural group are willing to accept unequal distribution of power. Collectivism is the tendency of people to belong to groups or collectives to look after each other in exchange for loyalty. Individualism is the predisposition to look after oneself and immediate family only. Accordingly:

> relationships between members of individualistic cultures are loose and individuals are expected to take care of themselves. By contrast, in collectivist cultures, cohesive groups give individuals their sense of identity and belonging, demanding considerable loyalty in return for the sense of security that they impart. (Hatch, 1997: 207)

Uncertainty avoidance is the extent to which people feel themselves threatened by ambiguous situations. Hofstede (1980) argued that different societies have different levels of tolerance for uncertainty, ambiguity and unfamiliar risks, and that these differences can be defined as the degree to which members of a culture feel threatened by uncertainty, ambiguity and risk.

Masculinity–femininity, according to Hofstede, refers to the distribution of roles between the genders. Masculinity is associated with assertiveness and competitiveness, whereas femininity is associated with modesty and a caring disposition. Clear differences emerged between the UK and Greece, particularly on the collectivist–individualist, uncertainty avoidance and power distance dimension (see Table 1).

Tixier (1996) argued that in Southern Europe (including Portugal, Spain, Italy and Greece) hierarchical distances are greater because authority is more centralised and management more autocratic. Calori and de Woot (1994) have argued that in the Latin or Southern European countries the management system is seen as 'chaotic', paternalistic and collectivist, and that this is particularly so in Greece. The differences described by Hofstede would lead one to speculate that managers from the UK and Greece are likely to differ in terms of style since: (i) individuals with an analytical style typically will seek certainty and avoid ambiguity; (ii) individuals with an intuit-

Table 1: Comparison of Greece, the UK, Hong Kong and Arab-speaking countries along Hofstede's four dimensions

Hofstede's (1980) dimensions	Arab-speaking	Greece	Hong Kong	UK
Power distance	80	62	68	35
Collectivism–individualism	38	35	25	89
Masculinity–femininity	53	58	57	65
Uncertainty avoidance	68	112	29	35

Sources: Hofstede, 1980; Hoecklin, 1995, pp. 30–8.

ive style are more likely to question norms and assumptions and hence may transgress the power-distance divide. Kirton (1994) drew a distinction between managers in general and innovators and entrepreneurs (who are presumed to differ in terms of their adaptor-innovator style) and linked this to societal or cultural norms:

> Where clear boundaries exist in a culture pattern, in the form of expectations that impose a limit on the behaviour of the individuals in that culture, then those people who show by their actions that they are prepared to cross those boundaries are more likely to be shown to be innovative. The more boundaries involved, and the more rigidly they are held in the society concerned, the higher the innovative score will be of those who cross. (ibid: 57)

Atiyya (1992) and Parnell and Hatem (1999) noted that there is a lack of empirical research into Arab management practices generally and Egyptian management in particular. Mezal (1988) observed that managers in the Middle East have tended to be older than their Western counterparts and a respect for seniority has been a feature of the organisational culture in this region. This suggests that Egyptian managers would have a high power distance based on Hofstede's analysis. Hofstede (1980: 44) grouped Arab-speaking countries together (Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia and United Arab Emirates) and indeed the Arab-speaking culture is characterised by high power distance and high uncertainty avoidance (however, it should be noted that Greece scored higher on uncertainty avoidance than Arab-speaking countries, see Hofstede, 1980). In Parnell and Hatem's (1999) study of senior executives in large organisations in Egypt it was found that: (i) solicitation of participation is viewed negatively, perhaps because it is interpreted as a sign of weakness in a high power-distance culture; (ii) there was a strong negative association between job satisfaction and loyalty, perhaps due to employees acting in accordance with the needs of the group even if this does not coincide with their own interests. Participation and consultation are preferred values in the Middle East and, furthermore, autocratic and authoritarian management structures are not perceived as desirable *per se* in the Arab world of organisations (Mezal, 1988).

In terms of Hofstede's research, Hong Kong has a low figure for uncertainty avoidance, and indeed this is lower than for any of the other national cultures addressed by this study. In terms of power distance the figure of 68 is relatively high, but is not as high as that for other Asian countries such as Malaysia (which has a score of 100). Hong Kong is the most collective of all of the cultures with a score of 25. This is interesting given that Britain ceded Hong Kong in 1842 and influenced its educational system, and may suggest that Hong Kong is likely to have been influenced by the British values, however, Britain is placed much more towards the individualistic end of the dimension according to Hofstede's research. Finally, in terms of masculinity and femininity, Hong Kong had a similar score to Greece and Britain, namely more towards the masculinity end of the dimension.

Since cognitive style is concerned with the fundamental management behaviour of organising and processing information (Allinson and Hayes, 2000: 169), it is not unreasonable to propose that the cultural differences between Egypt, Greece, Hong Kong and the UK may be associated with differences in cognitive style. Indeed, Allinson and Hayes noted a statistically significant difference between UK managers and their Jordanian counterparts ($p < 0.05$) with the UK managers being more intuitive (lower CSI score). As has been noted, Sadler-Smith *et al.* (2000b) studied the cognitive styles of owner managers in the UK and in Hong Kong and found that the Hong Kong owner managers were much more analytical (higher CSI score) than their UK counterparts.

The picture painted so far of a simple and straightforward association between national culture and cognitive style is, however, problematical given that some authors have presented evidence in support of greater degrees of similarity than difference between different national cultures in terms of their cognitive styles. Kirton (1994) reported a study by Thompson (1980) in which a sample of English-speaking managers from Singapore and Malaysia had a mean Kirton Adaptor-Innovator (KAI) (Kirton, 1976) score of 97.6 'close to that of their English counterparts' (Kirton, 1994: 56). Similarly, Kirton reported a number of other studies from which he concluded that 'when groups of different nationalities share a broadly similar culture their mean *AI* scores show very little variation'. Furthermore, building upon the work of Prato Previde (1991), in a detailed study of the psychometric properties of the KAI for three different cultures (English, Slovak and Italian) and through a comparison with previously published norms, Kubes came to the opinion that:

> Remarkably, the cultural effects, though important and interesting were limited. Therefore the Slovak data, in our view, provide further support for the hypothesis raised by Prato Previde (1991) that cognitive style, *as measured by the KAI*, is almost wholly unaffected by cultural variations . . . and supports the notion that cognitive style is deeply embedded in personality. (Kubes, 1998: 196, italics added)

Predicated upon the assumption that the style theories of Kirton and Allinson and Hayes are broadly similar, there appear to be conflicting perspectives with regard to cross-national differences in cognitive style. One perspective based on Kirton's theory and supported by the work of Kubes (1998) and Prato Previde (1991) using KAI data, maintains that style is independent of culture. In the other view, supported by the work of Abramson and his co-workers and Allinson and Hayes, cognitive style is seen as being related at least to some extent to national culture. Using Hickson and Pugh's model, Allinson and Hayes' research found that there were 'no significant cognitive style variations between nations *within* culture slices [groups]' (Allinson and Hayes, 2000) which appears to suggest that there will be intra-group similarities but inter-group differences. Furthermore, they argue that on the basis of their findings it may be 'more fruitful to classify nations in terms of their stage of industrial development rather than the hemisphere in which they are located' (ibid: 161). If style is related to national culture, this leads us to the prediction that, since Egypt, Greece, Hong Kong and the UK occupy different cultural groupings in the Hickson and Pugh and Hofstede models, the differences between the mean CSI scores for Egyptian, Greek, Hong Kong and UK participants are likely to be statistically significant. We aimed to test this assertion using two studies that were cross-sectional in nature and employed a convenience sample of undergraduate and post-graduate management students as participants. Locke (1986) and Abramson *et al.* (1993) justified the use of student samples in management research by saying that they may give more homogeneous groups and better-balanced samples. It should be noted, however, that while matching of samples could help to improve the rigour of cross-cultural research (Sekaran, 1983), there might be a concomitant lowering of the external validity of any findings (Abramson *et al.*, 1996).

Method

Data collection

Instruments

For both Study 1 and Study 2 the measure of cognitive style used was the Allinson-Hayes' (1996) Cognitive Style Index (CSI). The CSI consists of 38 trichotomously scored items (true; uncertain; false). Twenty-one of the items are worded in such a way as to indicate an analysis orientation (e.g., 'I am most effective when my work involves a clear sequence of tasks to be performed'). The analysis items are scored positively (i.e., true, 2; uncertain, 1; false, 0). Seventeen of the items indicate an intuitive orientation (e.g. 'Formal plans are more of a hindrance than a help in my work'). The intuition items are reverse scored. The theoretical maximum is score is 76 and the theoretical minimum is zero. The higher the score, the more analytical a person's style; the lower the score, the more intuitive they are. Items are ordered randomly on the final form (Allinson and Hayes, 1996: 124). Test-re-test reliability has ranged from 0.78 to 0.90 (Allinson and Hayes, 1996: 126; Armstrong *et al.*, 1997: 214; Murphy *et al.*, 1998: 598). Construct validity has previously been claimed through maximum likelihood factor analysis and correlational studies (see Allinson and Hayes, 1996; Sadler-Smith *et al.*, 2000b).

Procedure

Data were collected from convenience samples during the course of normal classes and participation in the research was voluntary.

Study 1: Results

Sample characteristics

The sample consisted of second year undergraduates who were following degree programmes in Business and Management Studies at higher education institutions in Greece, Egypt and the UK. The samples were closely matched in terms of characteristics such as age, gender balance and educational background and programmes of study. The sample consisted of 48 Greek respondents (56.3 per cent females and 43.7 per cent males), 45 Egyptian respondents (53.3 per cent females and 46.7 per cent males) and 52 UK respondents (38.5 per cent females and 61.5 per cent males). The vast majority of the sample (90.1 per cent) were under 24 years of age.

Descriptive statistics and reliabilities

The means and standard deviations are shown in Table 2. Inspection of the histograms of CSI scores for each sample revealed their distributions to be approximately normal. The internal reliability of the CSI for the UK sample was satisfactory (Cronbach's $\alpha > 0.70$) and compared well with those for other studies, for example, Armstrong *et al.* (1997). The internal reliabilities for the Greek and Egyptian samples

Table 2: Sample characteristics and descriptive statistics for Study 1 (business and management undergraduates)

Sample	N	Males (%)	Mean	SD	Range	α
Greece	48	43.7	42.52	8.15	12–59	0.64
Egypt	45	46.7	43.20	8.15	27–64	0.32
UK	52	61.5	43.52	10.96	20–70	0.81

were less than the generally accepted salient value of 0.70. Previous research with non-UK samples has demonstrated acceptable internal reliabilities, for example, Murphy *et al.* (1998) reported an internal reliability of 0.83 for a Canadian sample of business and management students.

Effect of nationality and gender

The effects of nationality and gender on CSI scores were tested by means of a two-way analysis of variance (nationality by gender). There were no statistically significant effects (main or interactive) of nationality and gender on CSI scores. Overall scores are comparable with the mean of 42.5 (SD = 11.8) reported by Murphy *et al.* (1998) for a Canadian sample of business and management students. In the same study a marginal effect of gender upon style was reported ($F = 3.87$; df = 1, 87; $p = 0.05$). In the present study the mean scores for males was lower than that for females (as observed in other studies, for example, Allinson and Hayes, 1996 and Murphy *et al.*, 1998), however, the differences were non-significant. The null hypothesis that the Egyptian, Greek and UK business and management students would have mean scores which were not significantly different was not rejected and does not support the assertion that subjects from different national cultural groups will have different cognitive style preferences. Furthermore, the means described here are comparable with a mean CSI score of 43.71 (SD = 13.37) for 284 Canadian law students reported by Doucette *et al.* (1998).

Study 2: Results

Sample characteristics

The sample consisted of post-graduate and professional development students who were following a variety of university-based programmes as follows: (i) Egypt: participants were following a Master of Business Administration (MBA) programme (n = 20); (ii) Hong Kong participants were drawn from courses in psychology/counselling (n = 38) and public sector management (n = 18); (iii) UK participants were following MBA (n = 21), Certificate in Management Studies (CMS) (n = 28) and Diploma in Management Studies (DMS) (n = 27) programmes. Some 50.7 per cent of the sample were female and the age characteristics were as follows: 18–24 years, 8.8 per cent; 25–34 years, 56.5 per cent; 35–44 years, 14.3 per cent; 45–54 years, 3.9 per cent; 55 years and over, 16.3 per cent.

Descriptive statistics and reliabilities

The descriptive statistics for Study 2 are shown in Table 3. As may be seen, these post-graduate and professional development samples were less closely matched than

Table 3: Sample characteristics and descriptive statistics for Study 2 (post-graduates)

Nationality	Sub-sample	N	Males (%)	Age < 35 (%)	Mean	SD	α
Egypt	MBA	20	45.0	55.0	44.35_{k}	12.47	0.43
Hong Kong	Counselling	29	44.4	77.8	43.90_{ij}	11.08	0.84
	Public sector management	18	44.4	55.6	46.33_{lm}	11.14	0.85
UK	MBA	21	71.4	55.0	36.95_{m}	11.43	0.82
	CMS	28	42.3	57.1	39.71_{j}	16.07	0.91
	DMS	27	44.0	60.0	34.56_{ikl}	12.06	0.84

Notes: Subscripts refer to groups between which the differences in mean CSI scores are statistically significant at the $p < 0.05$ level (Duncan multiple range test).

were the undergraduate samples. The levels of internal consistency for the CSI were consistently high ($\alpha \geq 0.82$) with the exception of the Egyptian sub-sample.

Effect of nationality and gender

The effects of nationality and gender on CSI scores were tested by means of a two-way analysis of variance (sub-sample by gender). There was a statistically significant effect of sub-sample upon mean CSI scores ($F = 4.83$; df = 5, 134; $p < 0.001$). There was no statistically significant main effect of gender nor was there any interaction between gender and sub-sample. The UK participants were in general more intuitive (lower CSI scores) than their Egyptian and Hong Kong counterparts (see Table 3 for sub-group comparisons). There were no statistically significant differences between the Egyptian and Hong Kong participants nor were there any statistically significant differences *within* the Hong Kong and UK national groups (that is between UK MBA, CMS and DMS nor between the Hong Kong Counselling and Public Sector Management groups).

Conclusion

The two studies here present, on the face of it, contradictory findings. Study 1, which used three closely matched samples, suggested that business and management students in Greece, Egypt and the UK do not differ in their cognitive styles. The educational models in the three institutions concerned were built largely upon 'western' business school models and this factor may have exerted a common influence across the samples. This does not support the argument that cognitive style differences will emerge from samples drawn from different cultural groups.

In Study 2, in which the samples were less closely matched, some differences were observed. In general, the UK participants were more intuitive (lower CSI scores) than the Egyptian or the Hong Kong participants — a finding that concurs with other cross-national research (for example, Allinson and Hayes, 2000). There were statistically significant differences between the UK DMS participants (the most intuitive UK sub-sample) and the Egyptian MBA participants and between particular Hong Kong and UK sub-groups. There were no statistically significant differences between Egyptian participants and Hong Kong participants. This could be as a result of cross-cultural differences in style (Sadler-Smith *et al.*, 2000b found Hong Kong owner managers were significantly more analytical than UK owner managers) or as a result of the sampling methods used.

If there are significant cross-cultural differences at post-graduate level, a number of issues for international post-graduate and professional development education and training are raised: (i) different national groups need to be aware of their own styles and those of other managers with whom they will come into contact; (ii) different national groups need to be aware of the impact of style differences and the ways in which these may manifest themselves in educational and training contexts; (iii) individuals of different national groups in training settings may utilise the strengths of others in the group in order that a balanced and harmonious approach to a task may be achieved. Equally, the potential implications for cross-national working are similar, and managers who take overseas assignments need to be aware of the potential impact of style differences in ways of managing.

At undergraduate level, there were no clear differences between Egypt, Greece and the UK. If these data do reflect a true lack of difference in the population, this may suggest that international business education at the undergraduate level need not take cognisance of broad style differences between different national groups; however, management educators do need to be aware of the fact that within any one group there are bound to be a range of style differences which need to be recognised and accommodated if the effectiveness of learning is to be maximised (see Riding and Sadler-Smith, 1997). Furthermore, at both undergraduate and post-graduate levels the extant differences in national culture *per se* are likely to be significant factors that management educators and developers need to take into account.

The findings of these studies with respect to the issue of style and national culture are ambiguous and underline the clear need for methodologically rigorous studies employing closely matched large samples in order to further explore the relationship between national culture and cognitive style.

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