Leadership Impact on Motivation, Cohesiveness and Effectiveness in Virtual Teams:
A FIRO Perspective

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by
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Dedication

This work is dedicated to my parents who nurtured my thirst for knowledge, supported me in my quest to learn all I could about people and who taught me to always try to give back as much as I take.
Acknowledgements

I would like to thank my husband Per for his unflagging support of my efforts, for his honest feedback and suggestions, as well as to thank our three children Danielle, Chris and Alison for their patience during the many days and evenings that I was less available to them during the time of this research. I would also like to acknowledge the great support and input from my advisors Professor Dominique Steiler and Professor Wu Min who dedicated many hours to reviewing my work and giving many helpful suggestions. Thanks also to my mentors Dr. Roger Pearman, Dr. Eugene Schnell, Dr. Henry L. Thompson, and Hafdis Thorsteinsdottir who have offered inspiration, enthusiasm and helpful feedback throughout the research process. Thanks to Ulla Nyberg, Gerard Antoine, Nina Dankfort-Nevel, Vahagn Donabedian, Hasse Karlsson, Bruce Hoechner, Martina Skansjo and Alexander Schultz for so kindly allowing me access to their organizations’ virtual team leaders and their virtual teams, and entrusting me with the coaching process. I would also like to extend my gratitude to Dr. William Parr, China Europe International Business School and Dr. Bo Zhang, Jiao Tong University who have been so generous with their time in helping me to understand and analyse the research findings. Lastly, I would like to acknowledge my fellow doctoral student friends who have continuously shown their faith in me and have offered wisdom and good humour which kept me going during times of difficulty. Without such a strong support network, I doubt that this work would have been accomplished.
ABSTRACT

Leadership Impact on Motivation, Cohesiveness and Effectiveness in Virtual Teams:

A FIRO Perspective

Leadership of virtual teams is complex and problematic, and requires heightened awareness of the inter-personal behaviours that motivate, involve, direct and support team members who are dispersed geographically, separated by time and distance. This research examined the impact of three sets of leadership behaviour, as described in FIRO Theory (Schutz, 1958) i.e. Inclusion, Control and Affection, and their relationship to team motivation, cohesiveness and effectiveness. A sample of 221 virtual team members within 31 operational virtual teams within 4 business organisations responded to an on-line survey measuring Perceived Leadership Behaviours in three FIRO areas Inclusion, Control and Affection; Perceived Team Cohesiveness; and Perceived Team Motivation. External team supervisors responded to a separate survey giving an external evaluation of each virtual team’s effectiveness. Data were analysed using bivariate correlational analysis. Findings showed significant positive relationships between Perceived Leadership Behaviours and Motivation (.460**), Perceived Leadership Behaviours and Cohesiveness (.453**), as well as positive correlations between Team Cohesiveness and Team Motivation (.525**). Of the three leadership behaviours, Perceived Affection had the highest correlation with Team Cohesiveness (.476**) and with Motivation (.453**).

Contributions of the study: A new, validated and reliable 30-item questionnaire has been developed to evaluate team members’ perceptions of expressed FIRO behaviours in virtual team settings, offering HR managers a practical tool for evaluating virtual team members’ perceptions of leader’s behaviour applying the FIRO model. Combined with the Motivation and Cohesiveness scales contained in the survey, this leadership behaviour feedback questionnaire offers HR managers a means to ascertain the motivation, cohesiveness and leadership perceptions of virtual teams.
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ABBREVIATIONS USED:
VTL = Virtual Team Leader; FTF team = Face-to-Face Team; CMC = Computer-Mediated Communication
Chapter 1
INTRODUCTION

This study investigates the relationship between virtual team leader behaviours and virtual team members’ perceptions of motivation and team cohesiveness, as well as team effectiveness as measured by external stakeholders. A virtual team can be defined for the purposes of the current study as an “interdependent group of individuals that work across time, space, and organisational boundaries with communication links that are heavily dependent upon advanced information technologies” (Hambley, O’Neill and Kline, 2007, p.1). Overall, the study explores the relevant findings about virtual team leadership, virtual team motivation, cohesiveness and effectiveness which have inspired the current investigation, outlines its research hypotheses, methodology, and finally discusses the results in light of their theoretical and practical implications.

The purpose of this chapter is to provide a rationale for the study. It discusses the scope of the study, as well as potential contributions to practitioners, managers, researchers and other interested parties. The chapter concludes with a chapter-by-chapter outline of the dissertation.

1.1 Rationale for the Study

The domain of “virtual team leadership” is becoming increasingly important to understand, given the rate of globalization of business typified by the increasing number of organisations today which operate virtual teams on a daily basis as a part of globalised operations (Townsend, DeMarie & Hendrickson, 1998). The benefits of working virtually are many; efficiencies of working around the clock as the sun moves around the globe,
ability to draw from talented team members wherever they live in the world, keeping team members close to globally mobile customers, and flexibility to deploy human resources where needed, are among most commonly mentioned benefits. (Lipnack & Stamps, 1997; Davis, 2004; Horwitz, Bravington & Silvis, 2006). These virtual team members work under new and relatively unexplored pressures: They work in different time zones, at great distances from other team members, do not see each other or their team leader frequently on a face-to-face basis, and must use telecommunications and computer-mediated communications to interact, plus there is pressure to do tasks needed by co-located managers and colleagues in competition with the virtual task (Kerber & Buono, 2004; Weisband, 2008). Although there is great interest from practitioners in overcoming these barriers to virtual team effectiveness, the “empirical studies of virtual team leadership are very limited and are mainly exploratory in nature” (Zhang & Fjermestad, 2006). In addition, these exploratory studies “do not offer conclusive causal links between the observed leadership and outcomes” (Yoo & Alavi, 2004).

The effectiveness and performance of virtual teams is vitally important to today’s globally dispersed companies but remains difficult to measure across different cultural and organisational contexts (Gibson, Zellmer-Bruhn & Schwab, 2003). Leadership and its impact on effectiveness of traditional, face-to-face (FTF) and associated theories of effective leadership are well-researched and supported (Yukl, 2000; Zhang & Fjermestad, 2006), however, virtuality changes the rules of the game (Zhang & Fjermestad, 2006; Weisband, 2008) and new models of leadership may be needed.

Motivational issues in virtual teams have been noted by some researchers showing that virtual team members experience feelings of frustration and isolation, perhaps due to the difficulties of missing spontaneous opportunities to communicate, to see other team
members face-to-face, or in other words, lacking the close human connection of traditional team settings. (Lipnack & Stamps, 1997; Sharifi & Pawar, 2002). From a leadership perspective, motivating others across long-distances when working virtually is doubly difficult; providing inspirational motivation, which includes “providing a compelling message, managing conflicting goals, providing feedback and establishing team identity” (O’Neill, Lewis & Hambley, 2008, p. 213) becomes more difficult when done using computer-aided communication technologies.

A manager of virtual processes at Renault reported that “It is a costly challenge to form, develop and maintain an effective virtual team, so it is very worthwhile to know how to keep them together”. Taking this one step further, we can surmise that an important goal for leaders should be to build virtual team “cohesiveness”. The challenge in building cohesiveness in virtual teams is rooted in the perceived distance between members of the team, both to each other, as well as to their team leader, where the lack of “shared understanding” due to distance and diversity causes problems in coordinating work using technology to interact (Hinds & Weisband, 2003). This distance been called “Affinity Distance”, comprising four types of distance: cultural, social, relationship and interdependence (Lojeski & Reilly, 2008, p. 42). Researchers argue that the greater the perceived distance between team members in any one of these four areas, the greater become the challenges for building a high-performing, cohesive virtual team (Lojeski & Reilly, 2008). However, on a hopeful note, there is some evidence that the right kinds of intra-team processes, including leadership, can mitigate these negative effects of distance, and “bridge the gaps” between team members (Manzevski & Chudoba, 2000; Knoll, 2001; Hoefling, 2008). Virtual team managers are able to do many things to build the “emotional bandwidth” of their teams to increase the feeling of cohesion, amongst others taking action
to ensure that strong relationships form among team members (Hoefling, 2008). Thus it is quite clear that the quality of leadership in such groups is vitally important to generating the needed level of engagement, effort and motivation needed to leverage fully the capacity of globally dispersed, virtual teams (Kayworth & Leidner, 2002; Weisband, 2008.)

Among the biggest challenges for virtual team leaders are taking care of the fundamentals that are necessary in leading any team, however the need for leadership in all areas of team leadership are elevated to a much higher degree of intensity (Duarte & Snyder, 1999; Davis, 2004; Kerber & Buono, 2004; Kahai et al., 2007; Joshi et al. 2009). Thus, as Kahai et al. (2007) summarized, virtual team leaders must do the basics, but do more of them, in the following areas at a minimum:

**Participation:**
Engaging, involving, sharing information, inviting members to participate fully, or in other words, taking the initiative to reach out to members, in order to have members commit their full efforts to achieving the purpose of the team

**Direction:**
Setting clear goals, expectations, measureable outcomes, following-up, and in other words providing structures and controls over the performance of the team

**Support:**
Encouraging, appreciating, getting to know members as individuals, providing personal mentoring, giving feedback, being open about team challenges, and providing opportunities for the team to “bond” and become a fully integrated, closely-knit unit.
Leaders who are pro-active in the above three areas of inter-personal leadership are perceived as being “more effective” in leading virtually (Kayworth & Leidner, 2002; Pauleen, 2003; Kerber & Buono, 2004; Horowitz et al., 2006). However, it is difficult to assess the degree to which a particular virtual team leader is taking the initiative to lead in these three areas of concern, much less to identify which of the leadership behaviours has the greatest impact on the team’s productivity or other outcomes (Kayworth & Leidner, 2002; Cummings, 2008; Lojeski & Reilly, 2008). Most researchers agree that there is a big difference between leading a traditional face-to-face team and leading virtually (Hambley, O’Neill & Kline, 2007; Weisband, 2008). Unfortunately, there is not enough empirical evidence for us to say with certainty what is the recipe for success in order to best lead a virtual team, thus there is still a need to examine more closely the “effects of specific leadership behaviours…to develop more specific and useful guidelines for leading in virtual teams” (Kahai et. al., 2007, p. 5).

1.2 Statement of the Problem

Given the challenges mentioned above, we need to understand more accurately the impact of different combinations of the fundamental aspects of team leadership, i.e. Encouraging Participation, Providing Direction and Offering Support on virtual team outcomes (Zhang & Fjermestad, 2006). We do not have enough empirical evidence from corporate operative team studies to know which types of leadership enable virtual team members to feel most highly motivated, to feel most connected to their virtual teams, and to become most effective in reaching their assigned objectives (Weisband, 2008). Furthermore, we lack measurements or feedback tools to ascertain to what degree a virtual team leader is perceived as exercising the required sets of leadership behaviours, assuming we can identify the most effective, motivating and cohesion-building behaviours as other research has indicated (Malhotra, Majchrzak & Rosen, 2007; Kahai et al., 2007). The present
research attempts to address the needs for more information and evidence of the best way to lead virtual teams and a practical way to measure perceived leadership of virtual teams.

1.3 Significance of the Study

The current study addresses a gap in the research literature related to the leadership effects on team effectiveness, motivation and cohesiveness of globally-dispersed, operative virtual teams in business. Most of the studies of virtual leadership have been done in laboratory-settings with student groups doing simulated virtual tasks and empirical field studies of leadership with operative corporate virtual teams are very limited (Zhang & Fjermestad, 2006). Furthermore, most of the empirical field studies have been exploratory in nature, following no existing theory of leadership, rather describe emerging or perceived patterns of effective leadership (Kayworth & Leidner, 2002; Pauleen, 2003; Kerber & Buono, 2004; Malhotra et al., 2007) Although the FIRO Theory of Interpersonal Relations (Schutz 1958) and the FIRO-B assessment has been a widely-used tool in management and leadership development globally since its publication in 1982, the framework has never been tested as to its relevance to leadership of virtual teams. The current study seeks to add to the practitioners’ knowledge of effective leadership and motivation of virtual teams bringing into play the FIRO framework to explore how it might relate to leadership effectiveness in virtual teams, in order to lend support to its relevance to current efforts in leadership development. The current study addresses the gap in our knowledge about the effective leadership of virtual teams by exploring the effect of all 3 sets of leadership behaviour described by FIRO theory, not only on Team Motivation, but also on Virtual Team Cohesiveness and Virtual Team Effectiveness.
It has been mentioned that virtuality has changed the rules of the game regarding effective leadership (Zhang & Fjermestad, 2006; Weisband, 2008) and that there is a need for practical leadership models to describe this new management situation. Practitioners, i.e. managers in organisations have expressed their frustration with the inaccessibility of most of the leadership theories that have been discussed in recent research on leadership due to their complexity, lack of relationship to reality, and difficulty in application to real life situations (Argyris et al, 1985; Cunningham, 1992). It seems clear that the requirements of virtual leadership demand more practical, more readily applied models of leadership than those we used in the past. It is hoped that by returning to the roots of social interaction theory, such as contained within the relatively straight-forward FIRO framework, practitioners will be able to identify behaviour sets which can be adjusted by the leader to fit the needs of his/her virtual team.

1.4 Objectives of the Research

Within the realm of the general problem domaine depicted in Figure 1 below, this research aims to distinguish the specific relationship between leadership behaviours, grouped into 3 domains of Inclusion, Control and Support, as described by FIRO Theory, and team outcomes of perceived motivation, perceived cohesiveness and an external measure of team effectiveness.
More specifically, the purpose of this study is to empirically assess:

1. Three sets of leadership behaviours that are visible and perceivable by virtual team members, in relationship to team motivation, team cohesiveness and team effectiveness.

2. Directional effects noticeable among these variables.

3. To verify earlier findings regarding leadership behaviours using other measures and frameworks.

4. To explore areas of further research in the area of virtual team leadership.

In light of these aims, we pose the following research questions, shaping the formulation of the research model:

1. What relationship does a virtual team leader’s perceived behaviours in Inclusion, Control and Affection have with Group Motivation?

2. What relationship does a virtual team leader’s perceived behaviours in Inclusion, Control and Affection have with Group Effectiveness?

3. What relationship does a virtual team leader’s perceived behaviours in Inclusion, Control and Affection have with Group Cohesiveness?

4. Is a Virtual Team’s level of Motivation related to its level of Group Effectiveness?
5. Is a Virtual Team’s level of Cohesiveness related to its level of Group Effectiveness?

6. Is a Virtual Team’s level of Cohesiveness related to its level of Group Motivation?

1.5 Definition of Independent Variables

Inclusion Behaviours
This is defined as the degree to which the leader is perceived as initiating inclusive actions in relation to virtual team members. These actions include inviting input related to team tasks, taking initiative to keep in touch, keeping members fully informed about team activities, sharing information, encouraging exchange of information among team members, and recognizing contributions. A key part of our definition of Inclusion for this study is the element of “initiative taking”, or the leader taking the first step to initiate the team members’ participation in team activities. Inclusion is described as “bringing others in” as opposed to “holding others out” (Schutz, 1958). This is consistent with the original measure in the FIRO-B psychometric assessment of Expressed Inclusion (Oxford Psychologists Press, 1997).

Control Behaviours
This is defined as the degree to which a virtual team leader is perceived as initiating structuring or directive actions in relation to virtual team members. These actions include establishing structured tasks, procedures and policies; setting a clear direction; providing clear guidelines for accomplishing individual tasks; giving clear directions; following up to see how work is progressing. It also entails the aspect of dominating group discussions, as this is consistent with FIRO B original measures for Expressed Control (Oxford
Psychologists Press, 1997) i.e. pushing the group to adopt his/her own ideas during meetings and influencing other team members’ opinions related to team activities.

**Affection (Support) Behaviours**

We define Affection, or for purpose of this study, “Support”, as the degree to which a virtual team member is perceived as initiating supportive actions of a personal nature in relation to virtual team members. The key distinction in our definition is “personal” in describing supportive behaviour. Thus, Support includes actions such as expression of personal appreciation for efforts even when team members are not fully successful; acting in a kind way; praising team members personally for contributions; providing personal mentoring; giving personal reassurance during difficult times; listening with genuine interest to members’ concerns; showing openness about their own true feelings related to team’s work; showing interest in knowing team members at a personal level, etc. This definition is based upon the Expressed Affection behaviour as defined and measured by the FIRO-B in its psychometric form (Oxford Psychologists Press, 1997).

As there was no pre-existing survey instrument available to operationalize the FIRO-B behaviour sets as perceived by others, these three independent variables are measured by a newly-designed 30-item questionnaire, which was face and content validated by expert panel (see p. 100) and tested for reliability (see p. 112) with acceptable results.

**1.6 Definition of Dependent Variables**

**Team Effectiveness**

Applying the definition used by Gibson et al. (2003), “team effectiveness” is the degree to which the team (1) fulfills its purpose, (2) meets the expectations of relevant stakeholders
(customers, supervisors, organisation), (3) delivers its outcomes on time, (4) produces high quality work, and (5) works productively/efficiently. Effectiveness may be thought of as the degree to which a virtual team fulfils management’s expectations in terms of deliverables, be it an innovation, a product, or reaching an organisational objective. In this study, a separate 25-item on-line survey measuring the above-mentioned five team effectiveness outcomes was administered to the 31 external-stakeholders, supervising the 31 participating virtual teams, thus gaining an “objective” external measurement of this variable.

**Team Motivation**

Motivation is derived from the Latin word “motere” meaning “to move”. For the purpose of our discussion in this dissertation, we use an integrative definition of motivation based upon Ford (1992) and Clark (1998)’s research: Motivation is “the organized patterning of an individual’s personal goals, emotion, and personal agency beliefs (Ford, 1992; Enciso, 2000) To be motivated, one must move in a “desired direction, with the requisite energy, and with persistence” (Ford, 1992; Bandura, 1997). The construct of team motivation is a group-level construct and multi-dimensional, and encompasses elements of both self-and group efficacy (Ford, 1992; Pintrich & Schunk, 1996; Bandura, 1997; Clark, 1998, Enciso, 2000). The definition of motivation used in this study is the Clark (1998) definition: Motivation = Commitment (Value, Emotion, Agency) combined with Mental Effort (Self-Efficacy and Group Efficacy). This variable will be measured by the Enciso (2000) Group Motivation Questionnaire based upon the CANE (1998) model of Motivation.
Figure 2: Variables Researched and Measurement Tools

Team Cohesiveness

Cohesiveness, sometimes referred to as “social cohesion” is defined as the degree to which “members of a group are attracted to other members and are motivated to stay in the group” (Bettenhausen, 1991; Festinger, Schachter and Back, 1950). Team cohesiveness or cohesion may be thought of as the strength of the “glue” holding a group of people together which makes them perceive themselves as a tightly-knit group. It incorporates (1) a sense of satisfaction with working together, (2) a commitment to keeping the group together, (3) a desire to work together in future, (4) a liking or affinity for the people in the team, and (5) a desire to meet virtually and face-to-face with others in the team. For purpose of this study, we use the Gross Cohesiveness Scale (Gross, 1957) adjusted for use within virtual teams to evaluate these five aspects of social cohesion.

1.7 Brief Overview of Related Literature

Although there is a growing body of research in leadership in virtual team settings, the most recent comprehensive review of the literature reports that research “has not kept pace with the growth of virtual teams” in industry and that we are “just beginning to understand leadership in virtual teams” (Kahai et al., 2007). Whereas some research on leadership of
virtual teams has been carried out in a laboratory-type setting, or with globally-dispersed
groups of university students, the number of studies dealing with functioning, corporate or
governmental entities’ virtual teams are still limited. Since the year 2000, there were 11
empirical field studies carried out exploring virtual team leadership. Of these, 8 field
studies involved operative virtual teams in corporations and three were laboratory-style
studies done with university students. Of these, four were exploratory case studies
describing aspects of leadership perceived as adding to team effectiveness (Pauleen, 2003;
Kerber & Buono, 2004; Horwitz et al. 2006; Malhotra et al. 2007) and four evaluated a
leadership theory and its causal impact on team outcomes (Allen, 2005; Cummings, 2008;
Wakefield et al., 2008; Joshi et al., 2009). Some recent studies focused on particular
leadership behaviours, ex. Leader informal communication style (Cummings, 2008),
leaders’ behaviour related to Transactional, Transformational, Inspirational and
Behavioural Complexity theories of leadership (Allen, 2005; Wakefield, Leidner &
Garrison, 2008; Moore, 2008; Joshi, Lazorova & Liao, 2009) and explored team outcomes
such as motivation, trust, conflict or performance (Allen, 2005; Moore, 2008; Wakefield,
Leidner & Garrison, 2008; Joshi, Lazorova & Liao, 2009; Cummings, 2008).

Findings of interest to this study: In the exploratory study by Malhotra et al., (2007)
effectiveness of virtual teams was linked with six particular leadership behaviours, that
can be approximately fitted into the FIRO theoretical framework under study here;
however, the complete set of inclusion, control and affection behaviours were not
explored, nor was there any analysis of causal links between the observed leadership and
team outcomes. Moore (2008) and Allen (2005) found a correlation between
transactional/transformational leadership behaviours and motivation in field research
involving virtual teams, although these studies differ in scope from the current study. Joshi
et al. (2009) showed a relationship between socialized relationship-building as described by Inspirational Leadership and team trust and team commitment, which is broadly related to our construct of cohesiveness. See Table 9 for a summary of virtual team leadership-related research in the past decade.

1.8 Delimitations and Limitations of the Study

This study investigates the impact of three sets of interpersonal behaviours, Inclusion, Control and Affection as described by FIRO Theory on the Perceived Group Level Motivation, Perceived Group Level Cohesiveness, and Group Effectiveness as measured by objective third party stakeholders responsible for teams output, through the current study of 31 global virtual teams and 221 team members. The study spans organisational contexts by involving several companies and one governmental trade organisation. The study also spans cultural contexts as team members come from a variety of national cultures and the majority of each team’s members are located in dispersed geographical locations. The hypotheses of the study allow exploration of which of the Expressed Interpersonal Behavioural dimensions has the greatest positive relationship with virtual team motivation, cohesiveness and effectiveness. The study examines the correlations and directionality between the dependent variables.

The limited size of the sample will limit our ability to generalize the results to all virtual teams. In addition, the study does not examine moderating or mediating effects of the following variables which may affect the effectiveness of virtual teams: degree of virtuality (number of face-to-face meetings), degree of task interdependence, degree of cultural diversity, richness of CMC technologies used for communication, levels of trust in the team, or demographical characteristics of the leaders or team members, such as gender,
age, seniority or experience. In addition, the current study chooses to focus only on one single theory (FIRO) in relation to team outcomes, and thus the effect of other leadership models is not evaluated in comparison to FIRO Theory, and this will also limit the generalizability of results to all leadership contexts.

1.9 Overview of the Dissertation

This study investigates the leadership of virtual teams and the impact of leadership on desired team outcomes, i.e. motivation, cohesiveness and effectiveness. This dissertation is organized into 9 chapters, followed by the list of references and the appendices.

Chapter 2, “Literature Review” focuses on the five areas of research which have served as the foundation for the conceptual developments of this study, namely: (1) Theoretical Leadership Research post-WWII to present day in relation to FIRO theory constructs; (2) Virtual Team Leadership Research; (3) Research on Effectiveness of Traditional and Virtual Teams; (4) Research on Motivation of Traditional and Virtual Teams; (5) Research on Cohesiveness of Traditional and Virtual Teams.

Chapter 3, “Research Hypotheses” outlines the areas of research interest and the primary and secondary questions to be investigated, and hypotheses to be tested.

Chapter 4, “Research Methodology” describes the rationale for the various methodological choices made in the current study. The data collection procedures and the statistical techniques used to analyze these data are described, as well as the sampling method, sample size, demographics, questionnaire design, pilot testing, and questionnaire testing procedures followed.
Chapter 5: “Statistical Analysis” reviews the procedures used in analyzing the data and the rationale for each method used.

Chapter 6: “Findings” describes the results of the data analysis in which the hypotheses are tested, accepted or rejected.

Chapter 7: “Discussion” explores the implications of the findings and suggests conclusions we can draw from this study,

Chapter 8: “Contributions of the Study” reviews areas of new information that have been gained from the current study, and benefits that might accrue to practitioners in HR and management as a result of the study’s findings.

Chapter 9: “Limitations and Future Research” reviews the limitations of this study imposed by the methodological choices of the study as well as additional areas for future research.
Chapter Two

LITERATURE REVIEW

The area of concern for this research lies at the intersection of four main bodies of research: Team Effectiveness, Team Cohesiveness, Team Leadership and Group Motivation. Each body of literature has been reviewed for relevant findings related to both traditional, face-to-face teams (hereafter referred to as FTF teams) as well as virtual teams (hereafter referred to as VTs).

The structure of the chapter:

Firstly, we offer a preliminary description of the theoretical basis of the current study, i.e. FIRO Theory in order to provide the framework for our discussions of the literature findings. This is followed by an overview of key leadership theories in the literature. Theories were selected for inclusion against two criteria: 1) does the leadership theory contain many commonalities with the constructs of the FIRO Theory of inter-personal behaviour? And 2) has the leadership theory been used as the basis for empirical research related to virtual team outcomes in the past decade? It was found that Directive/Initiating Structure (Fleishman, 1953); Initiating Consideration (Stogdill, 1957); Participative Leadership (Likert, 1967); Situational Leadership (Hersey & Blanchard, 1974) and Leader-Member Exchange (Dansereau et al., 1975) shared many commonalities with the FIRO Theory and were thus included. Transactional Leadership and the Path-Goal Theory (House, 1971); Transformational Leadership (Bass, 1985); Behavioural Complexity (Denison et al., 1995) as well as Inspirational Leadership (Joshi et al., 2009) have been used as the basis for Virtual Team Leadership field studies in the past decade, and also overlap in some ways with FIRO theory.
Secondly, we will review the literature findings related to Virtual Team Leadership studies, structured around our 3 Dependent Variables (DVs) under study, i.e. Motivation, Cohesiveness and Effectiveness. Thus, each section of the literature review will discuss each of these aspects, in light of findings related to leadership behaviours in Inclusion (Participative Behaviours), Structuring (Control) and Supportive Behaviours, which are the 3 Independent Variables (IVs) in this study.

2.1 Theoretical Basis of the Current Study: FIRO Theory

A formal 3-part theory of interpersonal behaviour, the FIRO (Fundamental Interpersonal Relations Orientation) theory was published by William Schutz in 1958, and subsequently widely researched and validated. Today the FIRO Theory and the FIRO-B assessment instrument, a 54 item questionnaire developed to measure behaviours when interacting with others, continues to enjoy widespread use and popularity (Fisher, Macrosson & Semple, 2001). Hurley (1990) estimated that FIRO B receives about 25 citations in the Social Science Citation Index annually, and it has been described by Furnham (1990) as being one of the three most widely used questionnaires in occupational psychology.

The FIRO B instrument, which measures interpersonal orientation regarding Inclusion, Control and Affection, as described by FIRO Theory (Schutz, 1958) has been and continues to be widely used in executive development and coaching, as it is useful in indicating an individual’s “comfort zone” when interacting with others (Schnell & Hammer, 1997; Pearman, 2002). The FIRO–B has been researched previously in relation to team compatibility (Liddell and Slocum, 1976), team roles in traditional work teams, (Fisher et al., 2001), team-development (Varney & Hunady, 1978) and propensity to act
as a mentor in a management setting (Siegel, Smith & Mosca, 2001) with useful results. However, there is no empirical study of the FIRO framework of behaviours in a leadership setting. Therefore, research into the applicability of the FIRO theory when examining individual leaders in their efforts to lead virtual teams would seem to be a logical next step in the continuing search for insight into leadership effectiveness.

2.2 Leadership Theories Relevant to Studies of Virtual Teams

Leadership has been defined in many different ways over time. Traditionally, we think of leaders as those who “influence individuals or groups so as to achieve group goals.” (Hoyt & Blascovich, 2003). Some researchers have offered a wider definition:

“Leadership is the process of influencing others to understand and agree about what needs to be done and how it can be done effectively, and the process of facilitating individual and collective efforts to accomplish a shared objective.”

(Weisband, 2008, p. 5).

Will Schutz, the author of the FIRO Theory, wrote of the “leader as completer”, in that the leader is “concerned with the total group operation and with assuring that all the specific functions necessary to accomplishing the goals of the group are being performed optimally (Schutz, 1976, p.166). Other scholars suggest that leadership “enables people to achieve more than they thought possible” (Bass & Riggio, 2006, p.22). Whatever definition we choose, leadership is as vital as ever in allowing organisations and teams under increasing pressure to achieve increasingly challenging targets, particularly difficult when working in a virtual environment. The FIRO framework shares important roots in sociology and psychology as some of the currently popular leadership theories and frameworks. Some of these theories have been explored by other virtual team researchers in the past decade, and thus, it would seem pertinent to review here those which relate to
leader behaviour, and to discuss how they share important foundations with the FIRO framework.

2.2.1 Early Executive Leadership Studies 1950s

The study of leadership comprises a very extensive body of research which has laid a good foundation for current research into virtual team leadership. Beginning in the early 1900s through the post-World War II decades, the study of leadership remained primarily focused on the leader’s distinguishing traits (Stogdill, 1948) i.e. intelligence, physical strength, height, energy, appearance, self confidence, sociability, will-power, etc.. These were in-born traits, and could not be “added” to a person’s nature or trained, thus the idea of the “born leader”. After WWII, scholars turned their attention to the types of leadership behaviours that were observable when leaders were interacting with others. In the early 1950’s, a series of research projects at Ohio State University and Michigan State University was undertaken, looking at executive behaviour in a number of Mid-West USA firms.

At Ohio State, the first type of leadership uncovered was called “directive leadership”, basing leader’s influence on his position power, including behaviours such as “command, direction, assigned goals, intimidation and reprimand” (Pearce et al. 2003, p. 275.). The second type of leadership, “initiating structure” was also identified at Ohio State (Fleischman, 1953) defined as “the extent to which an individual is likely to define and structure his role and those of his subordinates toward goal attainment” (DiMarco, Kuehl & Wims, 1975, p.209). In addition, Ohio’s study discussed a third category of behaviour; “initiating consideration”, where leaders demonstrate caring and concern for employees (Stogdill, 1957; Halpin & Winer, 1957; Yukl, 2002). Initiating consideration was defined
as “the extent to which an individual is likely to have job relationships characterized by mutual trust, respect for subordinates’ ideas, and consideration of their feelings.” (DiMarco et al., 1975, p.208). Empirical tests were done to ascertain if these two leadership orientations correlated to FIRO dimensions and found that Initiating Consideration correlated to Inclusion and Affection, and Initiating Structure correlated to Control (DiMarco et al., 1975; Kuehl DiMarco & Wims, 1975).

The Michigan State studies reached similar conclusions, but with the addition of participative leadership, i.e. that there were primarily three groupings of leadership behaviours: 1) task-oriented behaviour; 2) relationship-oriented behaviour and 3) participative leadership. (Likert 1967; Yukl, 2002). Around the time of the Michigan and Ohio studies, in 1950, the Korean War broke out, and it was during this time that Will Schutz began research on leadership and success factors of team interaction on the crews of battleships and submarines under contract to the US Navy (Schutz, 1958). Schutz’s FIRO Theory was first published in 1958, and interestingly, parallels the findings of the Michigan studies, where the three behaviour groupings Likert identified are seem to be reflective of Schutz’s Expressed Control, Expressed Affection and Expressed Inclusion, although aside from the DiMarco et al. study, these parallels have never been empirically tested in the literature.

McGregor (1960) discussed some popular beliefs that leaders and organisations held about managing people prevalent at this time, resulting in a 2-factor theory of leadership: Theory X and Y. Theory X proposes that the basic nature of the average employee is that they avoid work, lack ambition, avoid taking responsibility, do not care much about organisational goals, are basically self-interested, and not very intelligent. Under Theory
X, workers are “psychologically immature people requiring dictatorial management” (Carbone, 1981, p.26). Leaders who were proponents of Theory X would naturally choose an autocratic, directive style of leadership. (Pearce et al. 2003). McGregor also distinguished Theory Y, where leaders based their actions upon a belief that people are basically “mature and seeking the responsibility inherent in participative management” (Carbone, 1981, p.27).

### Table 1 Comparison of Early Executive Leadership Studies and FIRO theory

<table>
<thead>
<tr>
<th>1950s Ohio and Michigan Studies Leadership Models</th>
<th>Distinguishing Features</th>
<th>Possible FIRO Equivalent Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive/ Initiating Structure (Fleishman, 1953)</td>
<td>Command &amp; Control Assigning tasks Giving direction Reprimand /Critique</td>
<td>Control** Control Control n/a</td>
</tr>
<tr>
<td>Initiating Consideration (Stogdill, 1957)</td>
<td>Concern and Care for Subordinates</td>
<td>Inclusion &amp; Affection*</td>
</tr>
<tr>
<td>Participative Leadership (Likert, 1967)</td>
<td>Involvement of subordinates in planning, setting goals and decisions</td>
<td>Inclusion</td>
</tr>
</tbody>
</table>

(*/** DiMarco et al., 1975)

#### 2.2.2 Transactional Theory

Important work on motivation and its linkage to effective leadership took place in the 1960s, which shaped the formation of a second important theory of leadership, “transactional” leadership. These theories are based upon relevant motivational models which also were published during this time period, i.e. Expectancy Theory (Vroom 1964) which proposed that people engage in “behaviours that will maximize their expected return from performance.” (Pearce et al. p.279) In addition, Exchange /Equity Theory contributed important theoretical support to the new leadership model. Exchange/Equity theory described how people seek “to achieve an equitable ratio between what they give
and receive from an exchange in comparison to what others give and receive from a comparable exchange.” (Pearce et al. 2003, p. 279) These two motivational theories provided the theoretical basis for House’s Path-Goal Theory (House, 1971), which explained how a leader’s consideration or initiating structure behaviours clarified the “path” towards organisational goals and thereby impacted subordinates’ satisfaction. In House’s theory, leaders needed to shape the way that employees viewed the trade-offs between their efforts and their own resultant satisfaction. In addition, leaders could employ four types of behaviours in order to shape employees’ motivation: directing, supporting, participative, or achievement-oriented behaviours. In summary, transactional leaders view their role as mediating an exchange or transaction between employee and organisation, based upon equitable rewards for performance (Hoyt & Blascovich, 2003).

Transactional Leadership, i.e. the Path-Goal Model, particularly Supporting behaviour (item 2 below) was found to be related to virtual team motivation (Allen, 2005). Silverthorne (2001) also found some support for the impact of Path-Goal leadership behaviours on motivation in traditional teams in Taiwan. Therefore, Transactional Leadership is included in this review to explore eventual parallels to the FIRO framework. These parallels are seen in the following aspects:

1. Directing behaviour may parallel Control
2. Supporting behaviour may parallel Affection
3. Participative behaviours may correspond to Inclusion
4. The Achievement-Oriented behaviours (leader sets challenging goals and establishes specific targets) may roughly correspond to Control behaviours in the FIRO framework

A caveat to mention here is that although these parallels seem intuitively possible, these have never been empirically tested in the literature.
Table 2. Comparison of Transactional Leadership and FIRO theory

<table>
<thead>
<tr>
<th>Transactional Leadership</th>
<th>Distinguishing Features</th>
<th>Possible FIRO Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ex. Path-Goal Theory</td>
<td>Supporting</td>
<td>Affection</td>
</tr>
<tr>
<td>(House, 1971, 1973)</td>
<td>Directing</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Participative</td>
<td>Inclusion</td>
</tr>
<tr>
<td></td>
<td>Achievement-</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Orientation</td>
<td></td>
</tr>
</tbody>
</table>

2.2.3 Situational Leadership

In the mid-1970s researchers turned their attention to the contingencies of leadership; i.e. the situation or the context of the leader’s immediate environment, including the needs of subordinates, that determines the best leadership style. The theoretical roots for situational/contingency theories of leadership can be found in the earlier work described in Theory X and Theory Y leadership frameworks (McGregor, 1960): if a leader believes according to Theory Y, he/she will have an “open-mindedness toward human needs and ability that makes it possible for the manager to adapt to the individual worker’s maturity and receptiveness towards responsibility…this leadership style coincides with the progression of workers from immaturity to maturity.”(Carbone, 1981, p. 26).

The leader’s adaptation to needs of followers is reflected in the Situational Leadership framework of Hersey and Blanchard (1974). The Situational Leadership Theory (Hersey & Blanchard, 1974) described four styles of leadership, along two dimensions, depending upon the degree of supportive vs. directive behaviour they choose to employ: i.e. Directing, Coaching, Supporting and Delegating. In FIRO terms, the parallels are roughly seen in Directing (High Expressed Control), Coaching (High Expressed Inclusion and Affection), Supporting (High Expressed Affection) and Delegating (Low Expressed Control) although these parallels have never been empirically tested in the literature.
Table 3 Comparison of Situational Leadership and FIRO theory

<table>
<thead>
<tr>
<th>Situational Leadership</th>
<th>Distinguishing Features</th>
<th>Possible FIRO Equivalent Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hersey &amp; Blanchard, 1974</td>
<td>Directing</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Coaching</td>
<td>Inclusion, Affection</td>
</tr>
<tr>
<td></td>
<td>Supporting</td>
<td>Affection</td>
</tr>
<tr>
<td></td>
<td>Delegating</td>
<td>Control (low)</td>
</tr>
</tbody>
</table>

2.2.4 Leader-Member Exchange Theory

The LMX (Leader-Member Exchange) Theory (Dansereau, Graen & Haga, 1975) described dyadic relationships between leader and subordinates, depending on the degree of intimacy reached in the dyadic relationship, progressing from the “stranger” stage, to “acquaintance” to “mature partnership” (Dansereau et al. 1975). One might identify situational variables that influence how this relationship progresses, for instance on the development of the subordinate’s competence, proof of dependability, effort, or other factors (Yukl, 2002). Subordinates with higher quality relationships (high LMX) with their leaders were reported in empirical tests to show higher commitment, higher motivation to perform, lower turnover, and other positive benefits (Graen, 2009) and eventually reach a state of “emotional bonding” (Graen, 2009) with their leader. In contrast, subordinates who remained in the “out-group” remained at a transactional level with the leader and were assigned less interesting, more mundane tasks. The LMX Theory, in its later stages of development was discussed as having become a “relationship-based approach to leadership….containing three domains within the construct of leadership, leader, follower and relationship.” (Graen & Uhl-Bien, 1995). In terms of the FIRO theory of interaction, the Inclusion behaviour seems similar to the degree of involvement a leader allows between himself and the subordinate; i.e. the more a leader includes the subordinate; the higher LMX will be in their dyadic relationship. As higher LMX emerges, then the Affection dimension of FIRO theory comes into play, in that the subordinate is taken
“closer” into the fold, and greater degrees of loyalty and intimacy might be expected to take place.

**Table 4  Comparison of LMX and FIRO theory**

<table>
<thead>
<tr>
<th>LMX Leadership</th>
<th>Distinguishing Features</th>
<th>Possible FIRO Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader-Member Exchange (Dansereau et al. 1975)</td>
<td>in-group” and “out-group” formation of close bonds (high LMX)</td>
<td>Inclusion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Affection</td>
</tr>
</tbody>
</table>

**2.2.5 Transformational Leadership**

In the late 1970s Burns introduced transformational and charismatic leadership (Burns, 1978; Bass, 1985; Yukl, 2002). Transformational leadership (Burns, 1978; Bass, 1985, Bass & Riggio, 2006) had four components: Charisma or Idealized Influence (followers identify with, trust and seek to be like the leader), Inspirational Motivation (leader communicates high expectations to followers and inspires them to share in the vision); Individualized Consideration (Leaders act as developmental mentors considering each subordinate as an individual) and Intellectual Stimulation (leaders stimulate subordinates to think in new ways about old problems) (Bass, 1985). Transformational leaders focus on transforming followers’ motivational state to focus them on higher level needs such as self-actualization (Maslow, 1954). Similarities between transformational leadership theory and the FIRO Theory may be found in the charismatic influence aspect, where a leader might Express Affection and Express Inclusion to bring followers closer to him/her; in the Inspirational Motivation aspect in Expressed Inclusion and Affection; in the Individualized Consideration aspect, which corresponds to again, Expressed Inclusion and Affection; and in the Intellectual Stimulation aspect, which would roughly correspond to Expressed Control, if one assumes that stimulation of new ways of thinking implies that the leader stands up strongly for a suggested path of action or goal, or frames the question
for his/her subordinates to address. This is a type of direction setting and thus might fall within the area of Control as described in FIRO theory (Schnell & Hammer, 1997; Pearman, 2002). Once more, FIRO theory has not been empirically researched as to its correlations with Transformational Leadership behaviours.

**Table 5 Comparison of Transformational Leadership and FIRO theory**

<table>
<thead>
<tr>
<th>Transformational Leadership</th>
<th>Distinguishing Features</th>
<th>Possible FIRO Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bass, 1985</td>
<td>Charisma or Idealized Influence&lt;br&gt;- Followers identify with, trust and seek to be like the leader&lt;br&gt;</td>
<td>Inclusion and Affection</td>
</tr>
<tr>
<td></td>
<td>Inspirational Motivation</td>
<td>Inclusion and Affection</td>
</tr>
<tr>
<td></td>
<td>Individualized Consideration&lt;br&gt;- Leaders act as developmental mentors&lt;br&gt; considering each subordinate as individual&lt;br&gt;</td>
<td>Affection</td>
</tr>
<tr>
<td></td>
<td>Intellectual Stimulation – leaders stimulate new ways of thinking about old problems</td>
<td>Control</td>
</tr>
</tbody>
</table>

Transformational Leadership has been investigated in several recent empirical field and laboratory studies of virtual team outcomes and has shown positive relationships with motivation, performance and team cohesion in student teams (Hoyt & Blascovich, 2003; Hambley et al., 2007) and new product development teams (Moore, 2008). Earlier work with computer-supported work groups (as opposed to virtual teams) showed that transformational leadership was related to group efficacy, a construct that is incorporated in the motivation model used in this study, and which in turn, is related to group effectiveness (Sosik, Avolio, Kahai & Jung, 1998).

**2.2.6 Behavioural Complexity**

Through the mid-1990s, the next school of thought to emerge responded to the fact that leadership contexts are increasingly complex, requiring leaders to excel at balancing
ambiguities or paradoxes, i.e. the “yin and yang” present in modern organisational contexts (Davis, 2004). Examples of the polarities or paradoxes that must be balanced include: task/relationship, head/heart, stability/flexibility (Davis, 2004; Denison et al. 1995). This school of thought was known as Behavioural Complexity Theory where “effective leaders are those who have the cognitive and behavioural complexity to respond appropriately to a wide range of situations that may in fact require contrary or opposing behaviours.” (Denison et al. 1995, p. 526). The Behavioural Complexity Model was used as the basis of an early exploratory study of virtual student teams (Kayworth & Leidner, 2002), and also shares some basis assumptions about leadership with the FIRO Theory and is therefore included in this review.

The Behavioural Complexity Model incorporated the Quinn Model of Leadership Roles, wherein a leader might be expected to play eight different, distinct roles, i.e. Mentor, Facilitator, Monitor, Coordinator, Director, Producer, Broker, or Innovator. Effective leaders were believed to be able to “perform all of these roles simultaneously” (Denison et al. 1995, p. 528). In FIRO theory, effective leaders decide which of the “three leadership levers (Inclusion, Control or Affection) to pull” (Pearman, 2002) and in what intensity, which would seem to demand an equal degree of dexterity on the part of the leader. In respect to both the Behavioural Complexity and FIRO Models, authors have noted that lack of flexibility, or “rigidity” is the enemy of leadership effectiveness, as it restricts the roles available to the leader, and the leader is trapped into performing those roles he/she feels most comfortable in. (Schutz, 1976; Schnell & Hammer, 1997; Denison et al. 1995; Pearman, 2002).

In search of possible parallels to FIRO behaviours, one might suggest that the mentor role demands high expressed Affection and Inclusion; the monitor and director roles demand
high expressed Control, the coordinator role demands high expressed Inclusion, as does the broker role. However, once again, no research has been done seeking correlations between FIRO and this theory.

Table 6  **Comparison of Behavioural Complexity and FIRO theory**

<table>
<thead>
<tr>
<th>Behavioural Complexity</th>
<th>Distinguishing Features</th>
<th>Possible FIRO Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denison et al. 1995</td>
<td>Mentor &amp; Facilitator Roles</td>
<td>Inclusion &amp; Affection</td>
</tr>
<tr>
<td></td>
<td>Monitor &amp; Director Roles</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Coordinator &amp; Broker Roles</td>
<td>Inclusion</td>
</tr>
<tr>
<td></td>
<td>Innovator</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Producer</td>
<td>n/a</td>
</tr>
</tbody>
</table>

2.2.7 **Inspirational Leadership and Post 9-11 Developments**

In the wake of the terrorist attacks of Sept. 11th, 2001 in the US, and the Financial Crisis of 2008 which we are experiencing at the time of this writing, scholars continue to seek new ways of leading others during crisis. One new model that has been identified, called “inspirational leadership” builds upon earlier work in transformational and charismatic leadership and proposes that inspirational leaders “motivate, build confidence, and ensure continued high performance even in tough times” (Wilson & Rice, 2004, p. 4). Joshi, Lazarova, and Liao describe Inspirational leaders’ behaviours as including three primary behaviours, together with some objectives, which can be approximated to three combinations of FIRO behaviours (although again, these parallels have never been empirically tested in the literature.)

Table 7 **Inspirational Leadership comparison to proposed FIRO Equivalents**

<table>
<thead>
<tr>
<th>Inspirational Leadership Behaviour*</th>
<th>Objective of Behaviour*</th>
<th>Proposed FIRO Equivalent Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicating a compelling vision</td>
<td>Reinforcing common goals of team</td>
<td>Inclusion with Control</td>
</tr>
<tr>
<td>Expressing confidence in team members</td>
<td>Enhancing group’s prestige and identity</td>
<td>Inclusion with Affection</td>
</tr>
<tr>
<td>Energizing team members</td>
<td>Encourage more personal interaction among members.</td>
<td>Inclusion with Affection</td>
</tr>
</tbody>
</table>

(*Joshi, Lazarova, and Liao, 2009)
The Joshi et al. project was the most recent study of virtual team leadership, where this type of leadership showed a relationship to increased levels of team trust, and commitment to the team, roughly corresponding to our Cohesiveness variable (Joshi et al., 2009).

Table 8 shows all the leadership models reviewed which have either been used in virtual team research in the past decade and the possible (not tested) parallels with FIRO expressed inter-personal behaviours.

**Table 8 Leadership Models Reviewed and FIRO Theoretical Equivalents**

<table>
<thead>
<tr>
<th>Leadership Theory and Authors/Publication</th>
<th>Distinguishing Features</th>
<th>FIRO Theory Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive/Initiating Structure (Fleishman, 1953)</td>
<td>Command &amp; Control Assigning tasks Giving direction Reprimand /Critique</td>
<td>Control Control Control n/a</td>
</tr>
<tr>
<td>Initiating Consideration (Stogdill, 1957)</td>
<td>Concern and Care for Subordinates</td>
<td>Inclusion/Affecti on</td>
</tr>
<tr>
<td>Participative Leadership (Likert, 1967)</td>
<td>Involvement of subordinates in planning, setting goals and decisions</td>
<td>Inclusion</td>
</tr>
<tr>
<td>Transactional Theories: Path-Goal Theory (House, 1971, 1973)</td>
<td>Supporting Directing Participative Achievement-Orientation</td>
<td>Affection Control Inclusion Control</td>
</tr>
<tr>
<td>Situational Leadership (Hersey &amp; Blanchard, 1974)</td>
<td>Directing Coaching Supporting Delegating</td>
<td>Control Inclusion, Affection Affection with Control (low)</td>
</tr>
<tr>
<td>Leader-Member Exchange (Dansereau et al. 1975)</td>
<td>in-group” and “out-group” formation of close bonds (high LMX)</td>
<td>Inclusion Affection</td>
</tr>
<tr>
<td>Transformational Theory (Bass, 1985)</td>
<td>Charisma or Idealized Influence - Followers identify with, trust and seek to be like the leader) Individualized Consideration - Leaders act as developmental mentors considering each subordinate as individual Intellectual Stimulation – leaders stimulate new ways of thinking about old problems</td>
<td>n/a Inclusion Affection Control</td>
</tr>
</tbody>
</table>
### Summary of Leadership Theory Literature

In this section, we have described many parallels between currently popular leadership theories used in virtual team research and the FIRO theory, namely transactional theories such as Path-Goal, Transformational Leadership, Behavioural Complexity, and Inspirational Leadership, although there are elements that each of these relevant and useful theories address which FIRO theory neglects, and vice-versa. As FIRO theory was not originally intended as an addition to the academic knowledge about “leadership”, (rather as a new theory about human inter-personal behaviour), it is highly interesting to this researcher to find so many similarities with these well-established and well-supported leadership theories. The simplicity of the FIRO model, in contrast with the complex prescriptions of several of these theories, would seem to lend itself to practical application in virtual team leadership, on an equal footing with the “best of breed” of theoretical leadership theories presented here.

### 2.3 Virtual Team Leadership Research Overview

Although there is a growing body of research in leadership in virtual team settings, the most recent comprehensive review of the literature (Kahai et al., 2007) reports that

| Behavioural Complexity (Denison et al., 1995) | Mentor & Facilitator Roles | Monitor & Director Roles | Coordinator & Broker Roles | Innovator | Producer | Inclusion & Affection | Control | Inclusion | n/a | n/a |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Inspirational Leadership (Joshi, Lazarova, Liao, 2009) | Communicating a compelling vision/clear goals | Expressing confidence in team members | Energizing team members with enthusiasm | Inclusion | Control | Inclusion | Affection | Inclusion | Affection | Inclusion | Affection |
research “has not kept pace with the growth of virtual teams” in industry and that we are “just beginning to understand leadership in virtual teams” (p. 1). As mentioned in Chapter 1, most of the VT studies in recent years have been exploratory in nature, or have used student teams in manipulated leadership settings which limits their relevance to business practitioners (Zhang & Fjermestad, 2006; Kahai et al., 2007).

Some very recent progress is being made in getting closer to identifying “causal linkages between leadership behaviour on team outcomes (Zhang & Fjermestad, 2006). Inspirational Leadership, viewed as a sub-set of Transformational Leadership, was found very recently (Joshi et al. 2009) to have some impact on team commitment (defined as “identification with and affective attachment to the team”) (Joshi et al., 2009, p. 241) and team trust (defined as “individual’s belief that work group members are competent and can be relied upon to complete their responsibilities toward the group”) (Joshi et al., 2009, ibid.) in corporate virtual teams. Team commitment as described in Joshi et al. (2009) is approximately equivalent to team cohesiveness in the current study. A recent study of new product development virtual teams showed that transformational and transactional behaviours in particular combinations have beneficial effect on motivation of team members (Moore, 2008). However, this study only measured individual motivation based upon a very limited range of motivation-related questions, and also failed to draw useful delineations of which leadership behaviours were most valuable to motivation, rather merely indicated that a combination “cocktail” of LMX, Path-Goal and Transformational Leadership was positively associated with new product team motivation. More helpful was the finding that a VT leaders’ path-goal (supportive) behaviours were seen to have positive impact on motivation (Allen, 2005) in virtual teams within the USA. Below is a summary
of the relevant field studies that have been conducted with virtual business teams related to leadership behaviours during the past decade:

Table 9  Leadership in corporate virtual teams, field studies 1999-2009

<table>
<thead>
<tr>
<th>Study</th>
<th>Key Variables</th>
<th>Sample</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joshi, Lazarova &amp; Liao (2009)</td>
<td>Inspirational Leadership Theory vs. virtual team members’ perceived trust and team commitment (cohesiveness)</td>
<td>247 team members within 91 teams, in global customer service organisation</td>
<td>Inspirational leadership (developing strong social relationships) was a predictor of team trust and team commitment (cohesiveness equivalent)</td>
</tr>
<tr>
<td>Cummings, J. (2008) PhD Thesis</td>
<td>Leader’s communication frequency intra-group and external, related to team performance</td>
<td>957 team members, 129 work groups in single multi-nat’l co.</td>
<td>Frequent informal contact from the leader is linked to higher team performance.</td>
</tr>
<tr>
<td>Malhotra, Majchrzak &amp; Rosen (2007)</td>
<td>Leadership practices, team effectiveness; exploratory descriptive</td>
<td>269 team members, 54 “successful” teams, 33 companies in USA</td>
<td>6 leadership practices that are reported to work well in creating effective VT</td>
</tr>
<tr>
<td>Horwitz, Bravington &amp; Silvis (2006)</td>
<td>Virtual team members’ perceptions of factors contributing to their team’s effective performance including leadership. Exploratory Descriptive by survey</td>
<td>115 team members, 69 technology companies, 16 countries</td>
<td>Linkage between the perception of high performance and: team’s level of planning, review mechanisms (feedback) and ease of obtaining expert assistance.</td>
</tr>
<tr>
<td>Allen (2005) PhD Thesis</td>
<td>Leadership Behaviours, Power Styles, Decision Styles and Trait I Virtual Team Motivation (Expectancy Theory)</td>
<td>274 virtual team members, 45 teams, USA service company</td>
<td>Correlation between Leaders’ Supportive Behaviour (Path-Goal Leadership Theory) and Motivation</td>
</tr>
<tr>
<td>Kerber &amp; Buono (2004)</td>
<td>Leadership Actions; exploratory case study</td>
<td>1 team, 11 members, in US, Ireland, Australia</td>
<td>Leaders who create a compelling team goal, share information, build relationship with team members are more successful at building successful VT.</td>
</tr>
<tr>
<td>Pauleen (2003)</td>
<td>Relationship Building initiated by the leader Exploratory study</td>
<td>7 Virtual Team Leaders, New Zealand companies</td>
<td>3 steps leaders take to build relationship with VT members.</td>
</tr>
</tbody>
</table>
In the following section, we discuss research findings in traditional FTF and VT leadership, vis-à-vis the three areas of our interest, i.e. Effectiveness, Motivation and Cohesiveness, and discuss findings of all relevant attempts to explain leadership, whether dealing with laboratory, student settings, or real-life corporate teams. We will also present findings from exploratory case studies of VT leadership, as they have been useful in helping to frame the hypotheses of investigation in the current study.

2.4 Effectiveness

2.4.1 Effectiveness of Traditional Teams

Given the prevalence of teams in today’s business setting, the most pressing concern for business managers is how to increase the results gained through using teams to accomplish tasks, as opposed to using independent working groups or individual solutions (Katzenbach & Smith, 1993). Thus, most of the studies of teams carried out over the past two decades have looked at the question of “what makes a team effective?” and “what might hinder this effectiveness?” Effectiveness can be seen as the results a team produces in (a) business outcomes, and (b) human outcomes. (Gibson & Cohen, 2003). The literature review provided by Cohen and Bailey (1997) defines effectiveness as measurable in three areas: (1) Performance Effectiveness in terms of the team’s output, both quantity and quality, for example, efficiency, productivity, response times, quality, etc.; (2) Member attitudes, for example, employee satisfaction, commitment, trust etc.; and (3) behavioural outcomes, for example, absenteeism, turnover, and safety. Other researchers concur with the importance of using multiple dimensions in their definitions of effectiveness (Hackman, 1990; Guzzo & Dickson, 1996; Cohen & Bailey, 1997). The measure of a team’s effectiveness, however, will vary according to the individual team’s
situation and mandate, and will best be ascertained by that team’s manager or others who hold a stake in its mission (Gibson & Cohen, 2003).

In the reviews of group effectiveness research by Cohen & Bailey (1997) and Bettenhausen (1991), many additional characteristics were identified which are linked to group effectiveness. Effective work teams in the traditional sense have clearly articulated goals (Hackman and Walton, 1986; McGrath, 1986; Hackman, 1990), work interdependently (Wageman, 2001), have “a large measure of autonomy to decide how they will use their human and material resources” (Hackman, 2002, p. 100), are not too large in size, i.e. they have between 4-6 members (Hackman, 2002).

Effective teams also have a clear idea of their tasks, responsibilities and work procedures. In a 1992 study of 41 information systems design teams involving 10 organisations, researchers found that the highest performing teams were those in which the managers exhibited constant control over assigning team member tasks and clarifying work procedures (Henderson & Lee, 1992). Other researchers found similarly that teams whose leaders provided team members with clear direction, task clarity, and structure were effective (Levi and Slem, 1995).

Team work should be supported by appropriate reward systems (Hackman, 1990; Katzenbach & Smith, 1993). It has been pointed out that if management desires a group to work towards collective goals as a true team, then the rewards and recognition offered by management should reward collective efforts, not only individual efforts (Hackman, 1990).
Teams are not born effective, rather they evolve in phases, an early observation about teams that has been studied for many years and known as Tuckman’s (1965) model describing five stages of group development: Forming, Storming, Norming, Performing and Adjourning. Maples (1988) did additional work to refine Tucker’s model and found that each stage was marked by different qualities: Forming stage was marked by “courtesy, caution, confusion and (seeking) commonality; Storming was marked by “concern, conflict, confrontation and criticism”; Norming was marked by “cooperation, collaboration, cohesion and commitment”; performing by challenge, creativity, consciousness and consideration”; and finally Adjourning was marked by “compromise, communication, consensus and closure”. (Maples, 1988).

As groups mature, their internal working processes evolve. The leader’s behaviour, for instance, was found to vary in nature, particularly in supportive (initiating consideration) and control (initiating structure) behaviours (Carew, Parisi-Carew & Blanchard, 1986). In the forming stage, a team leader thus is expected to initiate more structure (control) than showing supportiveness, (initiating consideration), with decreasing levels of control exhibited as the group matures and moves towards the Performing stage. These phases roughly parallel Hersey and Blanchard’s Situational Leadership Model. (Hersey & Blanchard, 1974). The stages of team development were linked to the FIRO Theory by Thompson (1995) who stated that the Forming stage is characterized by team member concerns about Inclusion; the Storming Phase characterised by members’ concerns about Control; and the Norming and Performing phases characterized by members’ concerns for Support /Affection. The question of whether all groups progress through these stages has been debated (Bettenhausen & Murnighan, 1985).
2.4.2 Effectiveness of Traditional Teams: The Leader’s Role

Before beginning the review of research on virtual team leadership and its impact on effectiveness, it would be useful to start with a few observations of research into traditional team leadership and its impact on traditional team effectiveness. This body of research shows a consistent focus on two primary leadership activities: (a) development and shaping of team processes (Kozlowski et al., 1996) and (b) the monitoring and management of ongoing team performance (McGrath, 1962; Hackman & Walton, 1986; Fleishman et al., 1991) Most of these leadership activities can be described in terms of the FIRO theory framework of interpersonal behaviours, as we shall discuss in more detail below.

**Inclusion Behaviours:** This is defined by Yukl et. al (2002) as “involving followers in making important decisions” and a “form of participative leadership” (p. 21). The Path-Goal Theory of leadership (House, 1971; House & Mitchell, 1974) incorporates the Consulting leadership dimension. Many researchers have investigated the effects of Consulting/ Participatory leadership, but although there is general agreement that participation in decision-making should have a positive effect on group motivation and performance, there is only mixed or weak correlations between Participatory leadership and employee satisfaction and performance found in empirical studies done over the past decade or so (Leana, Locke, & Schwieger, 1990; Sagie & Koslowsky, 2000). A person’s predisposition to include others in making decisions that affect them, as well as to involve others in matters of importance to them, are measurable by the FIRO B, and described by FIRO theory (Schutz, 1958) as important aspects of Expressed Inclusion.
**Structuring Behaviours (Control):** These leadership activities have been called “initiating structure”, i.e. task-oriented, directive behaviours (DiMarco, et al., 1975; Yukl et al. 2002). Some of the key structuring activities identified in the literature as summarized by Yukl et al. (2002) were: 1) Short-Term Planning, 2) Clarifying Responsibilities, and 3) Monitoring Operations & Performance.

“Short-term Planning” is defined as “deciding what to do, how to do it, who will do it, and when it will be done” (Yukl et al., 2002, p. 18). Although planning is difficult to observe, there are some concrete outcomes of planning, such as written plans, GANTT charts, budgets, schedules, meetings to discuss plans with others, etc. When the leader communicates these plans to others, whereby organizing others to implement the plans, is an illustration of Expressed Control in FIRO terms (Schutz, 1958; Schnell and Hammer, 1997; Schnell, 2000).

“Clarifying Responsibilities” is another leadership activity defined as “communication of plans, policies, and role expectations” (Yukl et al. 2002, p. 19) It also entails setting clear objectives, looking for efficient ways to carry out tasks, talking with each team member to clarify their responsibilities and how they will carry out tasks. It is a major ingredient within the behaviour referred to in earlier research as “initiating structure” (Fleischman, 1953) and is a fundamental element of directive leadership behaviour described in the Path-Goal Leadership Theory (House, & Mitchell, 1974). Although research related to the impact of “initiating structure” on performance shows mixed results and no clear linkages, Yukl et. al 2002 cite several studies, (Fisher & Edwards, 1988; Podsakoff, MacKenzie, Ahearne, & Bommer, 1995), where there was some evidence that Clarifying was linked to managerial effectiveness (Yukl et al. 2002 ). Clarifying, as it relates to setting clear goals and objectives, has been shown to impact higher performance, as long as the goals are
understood and accepted by the followers (Locke & Latham, 1990.) The behavior of “clarifying”, seems to be necessary as a part of Operationalised Planning, and also embodies the FIRO behaviour, Expressed Control. Individuals who have a high need for Expressed Control, will find themselves naturally telling others what to do, how to do it, etc. in clear, unambiguous language (Schutz, 1958; Schnell & Hammer, 1997) and letting others know what their expectations of them are, as well as what their role responsibilities are, all of which fall under this behavioural heading.

“Monitoring Operations & Performance” is defined by Yukl et. al (2002) as “gathering information about the operations of the manager’s organisational unit, including the progress of the work, the performance of individual subordinates, the quality of products or services and the success of projects or programs.” (p.19) Monitoring, often called “following up”, is key part of supervisory behaviour, and is seen as a “distinct and meaningful leadership behaviour” (Yukl et al. p. 19) borne out by observational research of managers (Mintzberg, 1973). Research shows that managers who engaged more frequently in monitoring behaviours were more effective managers (Komaki, 1986; Komaki, Desselles, & Bowman, 1989).

**Supportive Behaviour (Affection):** In the literature dealing with traditional teams, supportive behaviour was defined as: “showing consideration, acceptance, and concern for the needs and feelings of other people” (DiMarco et al., 1975; Yukl et al., 2002 p. 20), or, as ‘reflecting an honest sincerity towards the welfare of the employees” (Wagner & Hollenbeck, 1998) and “the work atmosphere is friendly and leader is seen as very approachable” (DiMarco, et al., 1975; Yukl, 2002). Supporting behaviour is a core element of consideration (Fleishman, 1953) as well as an element of “individualized
consideration” (Bass & Avolio, 1990; Podsakoff, et al., 1990). When employees are in a position that is stressful, boring, tedious or dangerous, then supportive leadership tends to increase the subordinates’ efforts and satisfaction by increasing self-confidence, lowering anxiety, and minimizing unpleasant aspect of the job (Allen, 2005). Supportive leadership is key to developing positive inter-personal relationships, and not surprisingly, has been shown to relate to employee satisfaction with the leader (Bass, 1990; Yukl, 2002) but not highly correlated with performance (e.g. Fisher & Edwards, 1988).

“Developing” is defined by Yukl et al. (2002) as closely related to mentoring and coaching, where a leader “shows someone a better way to do a task, helps someone learn from a mistake, or explains how to solve a complex problem, rather than just providing the solution” (p. 21). It is also seen in leaders who give employees opportunities to grow, whereby the employees build self-confidence and new skills. The developing activity, as described here, could be argued as requiring Expressed interpersonal FIRO behaviours in both Inclusion and Affection areas, or a combined inter-action that has been called Expressed Warmth in previous research of mentoring (Siegel et al., 2001) or “nurturance” (Macrosson, 2000).

2.4.3 Virtual Team Effectiveness: Influencing Factors

There are numerous factors which previous research on virtual team processes and outcomes has shown to have influence on the effectiveness of virtual teams. Most research has centered around the following six areas: life-cycle, trust, task design, degrees of virtuality, cultural diversity, and effects of computer-mediated communication (CMC) technologies. These are all factors which are not included in the current study’s set of
Life-Cycle Issues

Tucker’s five stage of team development was addressed in the case study of 8 virtual teams (Lee-Kelley, Crossman & Cannings, 2004) which found that indeed the development phases do occur in the order Tuckman (1965) had indicated, but that “moving successfully from one stage to the next appeared dependant on the number and frequency of face-to-face meetings”. (Lee-Kelley et al. p. 653). Without this crucial “face time” the teams could not get to know each other well enough to “form” as a team. (Fisher & Fisher, 2001; Lee-Kelley et al., 2004). It is also during the first face-to-face meetings that the team’s norms are established for how the team will work together. Thus, it has been reported that during this early stage of a virtual team formation, the leader must take a disciplined approach towards team development (Furst, Reeves, Rosen & Blackburn, 2004). Furthermore, it is harder for virtual teams to “storm” given that the challenges to leadership may take longer to come about or be hidden from view (Davis, 2004).

Trust

Trust is vitally important within traditional teams, but even more so in virtual teams as borne out by empirical research within virtual teams in recent years (Handy, 1995; Jarvenpaa, Knoll & Leidner, 1998; Jarvenpaa & Leidner, 1999; Pauleen, 2003; Lee-Kelley, Crossman & Jennings, 2004). The most effective virtual teams have created ways to build and maintain trust, and the leader plays a role in this. Joshi et al. (2009) showed that Inspirational Leadership behaviours help to increase team trust. Some studies suggest that trust and the ability to form trusting relationships resided at the individual level and
there was no consensus within the group as a whole regarding how to encourage trust formation (Lee-Kelley, et al., 2004). However, other research (Pauleen, 2003) shows us that a leader can influence and promote the formation of trust among team members through helping them to get to know each other better, face-to-face, as well as using telephone conversations, one-on-one, prior to getting into purely computer-mediated communication (CMC) supported exchanges (Pauleen, 2003).

**Task complexity and interdependence**

Bell and Kozlowski (2002) performed an analysis of different types of virtual teams and created a typology for understanding the leadership implications of different types of virtual teams, as well as design factors. The task was a primary dimension of concern. If a virtual team has a less complex task, there will be less need for synchronous (same time) communication and collaboration between team members, rather the tasks would be done sequentially (asynchronously) and additively (i.e. each team member adds his or her input to that of the colleague’s input) (Tesluk, Mathiue, Zaccaro, & Marks, 1997). In these situations, asynchronous communication (email or screensharing) “will usually be sufficient because the need for reciprocal communication and interdependence is minimal” (Bell & Kozlowski, 2002, p. 24). As tasks grow in complexity, however, there is a need for more coordination, collaboration, and thus richer forms of communication, and more synchronous communication, including real-time feedback (Hollingshead, McGrath & O’Connor, 1993). Interdependence of the task may also have an impact on team outcomes, including effectiveness and cohesion (Gully, Devine & Whitney, 1995; Gibson & Manuel, 2003; Gibson & Cohen, 2004). Three forms of interdependence are noted as being relevant for teams in general: goal interdependence, task interdependence and outcome interdependence (Wageman, 2001).
Task interdependence has been studied recently in a field study of 58 virtual teams confirming the moderating role of task interdependence and collaborative technology on the formation of “collaborative partnerships” (Pinjani, 2008). The concept of task interdependence was studied in relation to knowledge sharing in virtual teams, resulting in a finding that task interdependence was a moderating factor influencing the level of trust in the team (Staples & Webster, 2008). A study of 31 virtual teams in Germany showed that leaders can impact motivation of virtual teams by purposefully designing virtual team tasks that are more interdependent (Hertel, Konradt & Orlikowski, 2004). In Manzevski and Chudoba’s 2000 study of three virtual teams within a multicultural global manufacturing company, it was found that the higher the degree of interdependence of the team task, the more communication incidents were initiated between team members. The level of task interdependence can be a moderating factor on the degree of cohesiveness, in that it moderates the degree of interaction needed between virtual team members, and thus the degree to which familiarity develops among team members (Manzevski & Chudoba, 2000). It is assumed in the current study that the teams share a common goal and are working moderately interdependently on their tasks.

**Degree of virtuality**

The degree of virtuality has become a factor of some research interest in recent years. Virtuality can include variations in the number of face-to-face meetings a team holds annually; i.e. they may range from purely virtual (never meeting face-to-face from beginning to end of their project) to semi-virtual (they meet once or twice or more times a year). Degree of virtuality also includes the “richness of communication medium” used within the team, where highly virtual teams use only e-mail (less rich) and less virtual teams use tele-conference, videoconference, which provide “richer” communication clues.
(Kirkman et. al. 2004, Manzervski & Chudoba, 2000). The geographic distance between team members is also part of this construct, where highly virtual teams’ members are spread out all over the world, in different time zones, whereas less virtual teams may in fact be located in the same city, in the same time zone but still do not have the chance to meet frequently face-to-face (Griffith & Neale, 2001; Kirkman et al., 2004). The degree of virtuality plays a role in how other internal processes of the virtual team function, including those under study here, i.e. effectiveness, cohesiveness, and motivation (Kirkman et al., 2004) as well as others not included in the study, i.e. trust, communication quality, etc. (Gibson & Cohen, 2003; Gibson & Gibbs, 2006;). This factor is a controlled variable in the current study; teams in the current study meet face-to-face a maximum of six times per year.

**Cultural diversity**

Virtual teams in global organisations such as those participating in the current study benefit greatly from a diverse set of talents, backgrounds, experience, and national culture represented within its membership. Most of the scholars who have researched virtual teams from 2000-2006 have included diversity in national cultures of its membership as one distinguishing feature of virtual teams (Maznevski & Chudoba, 2000; Gibson, Conger & Cooper, 2001; Gibson & Cohen, 2003; Gibson & Manuel, 2003). The most common issue created by having multiple national cultures present on a virtual team is the potential for misunderstanding messages and subsequent potential for conflict, decreased levels of team trust and decreased productivity (Townsend, et al. 1998; Jarvenpaa & Leidner, 1998; Kayworth & Leidner, 2002) The way the team handles these cultural differences determines the success of the team endeavor; As Snow et. al. (1996) noted in early work on globalization using trans-national teams:
Effective transnational teams directly confront the multi-cultural issues that inevitably arise in the group and search for ways to resolve them. Ineffective teams either ignore such issues or hope they can be resolved by the HR department or through some type of outside training. (Snow, et al. 1996, p. 61)

Some researchers have examined preferences for leadership style across cultures within global virtual teams, revealing that there are indeed differences for how followers prefer to be led depending on their national culture (Den Hartog et al. 1999; Gibson, et al., 2001; Howard, 2004). This is not at all surprising, given the research that has been done on cultural differences and leadership, in itself a very rich literature pool (Hofstede, 1997; Trompenaars & Hampden-Turner, 2002) In traditional teams, these preferences for leadership style have been seen for instance in a study of Korean R & D team members, where it was found that these team members appreciate higher degrees of control by their leaders, given their higher need for hierarchical structure and respect for authority, as well as the Korean culture’s noted higher needs for uncertainty avoidance (Oh et al. 1991) These preferences are true for team members in many societies sharing the characteristics of high uncertainty avoidance and hierarchy, such as seen in Korea, Japan, Taiwan, and the PRC, as described by Hofstede’s work in the 1980s and substantiated by later research in the GLOBE project (Hofstede, 1997, House et al., 2004). It is assumed that cultural diversity will always play a role in moderating how leadership is viewed by the team members in any virtual team study, however we will not control for this effect, rather will assume that cultural diversity is a basic operating condition of all the teams under study.

Effects of Computerized Mediated Communication (CMC) Technology

There is a large body of literature dealing with the richness of communication medium used in virtual team interaction, examining the impact of CMC technologies on VT processes and showing relational effects on team effectiveness (Manevski & Chudoba,
It has been mentioned earlier that one of the major challenges to effective communication in virtual teams is the lack of visual clues from body language, and the negative impact of this aspect of virtual working. As Horowitz et al. note, “in global teams, workers seldom operate in a communication rich environment.... much of the communication occurs by way of e-mail, electronic conferencing or voice mail, channels that offer limited information and are not interactive.” (Horowitz, et al., 2006, p. 476) Over-coming these challenges, even with the best virtual CMC technologies, demands that the VT leader, as well as the team members must make extra efforts to use whatever technologies they have, in order to build interpersonal relationships and to bridge communication gaps (Horowitz et al., 2006). One assumption in the current study is that all VTs have access to similar types of CMC technologies, i.e. web-based collaboration tools, email, teleconferencing, instant messaging, etc. and as such, CMC technologies are not investigated as a variable in the current study.

2.4.4 Effectiveness of Virtual Team: The Leader’s Role

Inclusion Behaviour and VT Effectiveness

Among the behaviours targeted for evaluation in studies of virtual team effectiveness, perhaps the Participative Behaviours are of particular interest, given the nature of the virtual team’s unique setting. Leaders serve as the “communications linking pin” between dispersed members (Lipnack & Stamps, 1997) and provide “regular, detailed and prompt communication with their team members and peers” (Kayworth & Leidner, 2001). This has been called “megacommunication” (Wardell, 1998). The leader of a virtual team must “establish, develop and sustain lavish information flow among all team members” (Kerber & Buono, 2004), which is highly participative, as defined within FIRO theory, showing
Inclusive behaviours. Effective team leaders in successful virtual teams surveyed report that frequent communication between the team leader and team members, even up to 15 hours per week, i.e. intensive communication, were vitally important to “keeping the team together” (Majchrzak, et al., 2004, p. 137). Malhotra et al., (2007) reported virtual team leaders organizing “virtual get-togethers” where the team reviewed its purpose, shared identity and internal working processes in order to gain energy and momentum. Leaders in these successful virtual teams ensured that there was full member participation during virtual meetings through “check-ins” during meetings (Malhotra et al. 2007). A very recent large-scale field study indicates that frequent communication of an informal nature from virtual team leaders plays a role in increasing that team’s performance (Cummings, 2008), corresponding to Inclusion in the FIRO framework.

Other participative leader behaviours flagged by Malhotra et.al (2007) included recognition of team members’ diverse sets of skills and backgrounds, forming an “electronic skill directory” (p. 64); sharing spontaneous bits of information and announcements between meetings to keep members engaged; and lastly, providing public recognition of the contribution of each team member to the external stake-holders, i.e. other managers with a stake in the activities of the virtual team. According to Malhotra et al, leaders exhibiting these participative, inclusive behaviours were perceived as contributing to the effectiveness of the virtual team. However, in the Malhotra et al. study, there was no analysis of directionality for these participative behaviours, impacting effectiveness, nor did the study provide any linkages to group motivation outcomes. It is hypothesized that the set of Participative behaviours, as identified by FIRO Theory, might show a positive relationship with the degree of team effectiveness, and this will be explored in the current research.
Structuring Behaviour and VT Effectiveness

Exploratory studies have been helpful in indicating some of the structuring activities that are perceived as increasing effectiveness in VTs, particularly goal setting, clarifying goals, specifying expectations, handling poor performance and monitoring performance. Malhotra et. al (2007) came closer to identifying leader structuring behaviours that correlate with effectiveness, in that their sample included only effective virtual teams, as assessed by objective evaluations by supervising executives of these teams. Their study showed that structuring behaviours seen as valuable to creating effective teams were 1) enforcing team norms for how the team will communicate and run its meetings, 2) making sure that the meeting agendas are adhered to, and 3) monitoring team progress, i.e. checking when “deadlines are missed or working protocols are not followed” (Malhotra et al. 2007, p. 66). Horowitz et al. (2006) found that “clarifying objectives, roles and responsibilities” was cited as the most important leadership activity needed for a successful start of a new virtual team project. (p. 483). Kerber & Buono (2004) found that the leader’s establishment of a “compelling goal” was associated with perceived higher team effectiveness, although there was no objective measure of Team Effectiveness used in this study, only team members’ perceptions of their own effectiveness. In Kayworth and Leidner’s 2001/2002 study, leaders who were able to “clearly articulate team members’ roles and responsibilities” (p. 27) and “exercise authority to follow-up on assigned tasks” were perceived as “effective leaders”; however, once again, this study did not link effective leadership perception with team effectiveness measures. These behaviours fall within the category of Expressed Control within the FIRO framework, and thus the current research seeks to explore the hypothesis that perceived control behaviours of the team leader are positively associated with greater degrees of team effectiveness.
**Supportive Behaviours and VT Effectiveness**

We have seen earlier in this chapter that supportive leadership behaviours are important to developing positive relationships in FTF teams, but how does this behaviour impact effectiveness of virtual teams? In the study of successful virtual teams carried out by Malhotra et al. (2007), among the 6 leadership practices identified as having connections with behavior performance, two of these relate directly to behaviours corresponding to the Expressed Affection sub-set of behaviours in the FIRO framework: “encouraging the team” and “connecting personally”. Leaders of successful teams knew exactly when it was necessary to step in to organize a virtual get-together to rejuvenate the team when it was experiencing fatigue or stress, having developed “a virtual sense for when these interventions were needed to reenergize their teams “ (Malhotra et. al. 2007, p. 63) These leaders help members connect with each other on a personal level, by helping team members re-connect socially with one another at start of all meetings. Kayworth & Leidner’s exploratory research supports this finding. “Virtual team leaders rated as effective by their members demonstrate first and foremost a mentoring quality characterized by concern for the members, understanding and empathy…the effective virtual leader is able to project these qualities”. (Kayworth & Leidner, 2002, p. 30).

Supporting behaviour, as described in these studies, is consistent with the FIRO dimension of Affection, particularly, Expressed Affection (Schutz, 1958; Schnell & Hammer, 1997; Schnell, 2000). The current research aims to determine if there is a linkage between Supportive Behaviour and the Effectiveness of Virtual Teams, which are operating under difficult, stressful and often isolated circumstances (Lipnack and Stamps, 1997; Davis, 2004). The current research seeks to test this finding with global operative virtual teams,
and will test the hypothesis that perceived affection behaviours are positively associated with group effectiveness.

2.5 Motivation

2.5.0 Introduction

It seems to be a well-accepted belief: The manager’s primary challenge is to motivate employees to do their best in the service of organisational goals at work (McGregor, 1960; Mintzberg, 1973; Peters & Austin, 1985; Ambrose & Kulik, 1999). Motivation has therefore, naturally been a major focus of much of the organisational behavioural research carried out in the 20th century, and yet our knowledge of the subject of motivation is “far from complete.” (Locke and Latham, 2004). With over 40 published research-based theories of motivation in existence, there have been many boundaries created between schools of motivation research, and little agreement on what is the true, singular model of human motivation (Clark, 1998; Locke and Latham, 2004). There is an “urgent need to tie these theories and processes together into an overall model” (Locke and Latham, 2004, p. 389) as well as a need to develop new models useful for describing “team motivation” (ibid. g. 392).

2.5.1 Definition of Motivation

Motivation, stemming from the Latin word motere, “to move”, has been analysed from ancient times, as man seeks to understand how to move himself and others towards desired goals. The word motivation implies movement towards fulfilling the needs of the self, or the organisation, and is thus a primary concern of organisational leaders. To be motivated, one must move in a “desired direction, with the requisite energy, and with persistence” (Ford, 1992; Bandura, 1997). Thus, a member of a team, or a virtual team, will perceive
him or herself as feeling motivated towards accomplishing the tasks set before the team, when he/she feels able to move in the desired direction with the desired energy and with the required persistence necessary to do their job. There are many various scholarly definitions of motivation. Ford (1992) defined it as “the organized patterning of an individual’s personal goals, emotions and personal agency beliefs”. Alternatively, motivation is described as “the set of internal and external forces that initiate work-related behaviour, and determine its form, direction, intensity and duration” (Pintrich & Schunk, 1996, p. 47).

2.5.2 Types of Motivation: Extrinsic/ Intrinsic

There are two kinds of motivation explored in the literature: extrinsic and intrinsic forms of motivation, as first researched and defined by Hertzberg (1968). Extrinsic motivation considers the external rewards or the “carrot or the stick” that can be brought to bear to get employees to move with “direction, energy and persistence”. For instance, a student will work hard in school to earn high grades, or to qualify for a scholarship award; an employee will work harder to earn a bonus, to gain recognition, to please the boss, or earn a promotion, with subsequently a higher salary. Intrinsic motivation is where the rewards for a person’s behaviour are internal to himself, or originate within himself in the process of doing a job, such as feelings of “flow” (Csiksezentmihalyi, 1992; Goleman, 1998), achievement, competence and self-determination (Deci, 1975). Those employees who are able to motivate themselves, i.e. to manage their own performance, are seen as being driven by the internal factors of intrinsic motivations, rather than solely looking for external rewards. As some scholars have noted, extrinsic motivators, such as salary, rewards, benefits, and recognition from outside stakeholders are experienced very commonly by employees working in traditional face-to-face team settings (Hackman,
However, the teams under study in this research project are considered “highly virtual” i.e. they meet (FTF) less than six times annually, and lack the same degree of face-to-face interaction with the leader and other team members, leading to a diminished relevance of extrinsic motivators (Kirkman et al. 2004). This leads us to focus on intrinsic measures of motivation in the current study.

2.5.3 Prominent Theories of Motivation

In recent reviews of the motivation theory literature (Ambrose & Kulik, 1999; Steers Mowday & Shapiro, 2004), it has been stated that there are three major streams of motivation research: Reinforcement Theories (ex. Skinner); Content /Need Theories (ex. Maslow, Hertzberg); Process Theories (Expectancy, Social Cognitive, Goal-Setting). More recent researchers propose a fourth category; Integrative theories (Ford, Clark). The content theories have some parallels to FIRO Theory and are researched in a recent study of VT motivation (Moore, 2008) and thus will be reviewed here. The relevant process theories to this study are Expectancy, Social Cognitive and Goal-setting, as they are supporting theories behind the Integrative Motivation model selected for use in this study. Reinforcement Theory is focused on rewards/punishments to reinforce behaviour, which is extrinsic motivation, deemed less relevant for virtual workers and thus, will be omitted from this review. (Kirkman et al., 2004).

The theory selected for use in this dissertation is the Commitment and Necessary Effort or CANE model, (Clark, 1998) which Clark describes as “one theory that incorporates the important components of the best and most current research and practice” in the work-related motivation field. (Clark, 1998, p. 2) The underlying theories behind Clark’s
integrative work are found in Cognitive Performance Motivation research, typified by Ford’s Motivational Systems Theory (1992) and Social Cognitive Theory (Bandura, 1997).

**Need/Content Theories**

These theories focused on what individuals need in order to feel motivated to achieve organisational goals. Murray (1938), Maslow’s (1954) hierarchy of needs, McClelland, Hertzberg and Alderfer were influential in shaping understanding of individual needs as motivators of behaviour at work. FIRO theory shares some common dimensions with many of these Content Theories as FIRO also discusses the level of individual need along the “wanted” and “expressed” behaviour dimension (Schutz, 1958, 1994). However, Schutz never posited his FIRO theory as a Motivational Theory, rather a Social Interaction Theory exclusively (Schutz, 1958). It remains of interest to this researcher however, to draw parallels between the early models of needs with the FIRO framework, as it may shed light on the relevance of the Expressed FIRO behaviours, (Inclusion, Control and Affection) as they may satisfy the needs of followers in these three human “need” areas and thus be related to motivation.

**Murray Theory of Needs:**

One of the earliest scholarly attempts at understanding motivation focused on needs as drivers of behaviour, exemplified by Murray’s (1938) theory of needs (Steel and König, 2006). Murray postulates that needs are “an internal energy force” (Steel and König, 2006, p. 895) which drives us to do whatever we need to do to satisfy these needs. Murray identifies two types of needs: primary or physiological and secondary or psychogenic, which were linked to our personality characteristics. Of the secondary needs, although Murray postulated that there actually were about twenty of these, later scholars (Maslow,
1954) suggests that there are only three main secondary needs: “the need for achievement, the need for affiliation and the need for power.” (Steel and König, 2006).

**Maslow’s Hierarchy of Needs**

Abraham Maslow, a psychologist and pioneer in motivation theory, building upon Murray’s (1938) work, formulated a ranking of human needs, the satisfaction of which provides people with impetus to take action. These needs are ranked into a hierarchy, and the emergence of one need depends upon the prior satisfaction of the need at the level preceding it. Once a need is satisfied, it no longer has a powerful impact on motivation, and as one need is satisfied, other ones appear so that the individual is always seeking to fulfill some need (Hellriegel, Slocum & Woodman, 1998). The lowest level needs are physiological needs (shelter, food, water, etc.); the next level are security needs (ex. safety, stability, absence of pain, threat or illness); followed by affiliation needs (ex. friendship, love, sense of belonging); next level were self-esteem or feelings of self-respect (ex. feelings of achievement, to be perceived as competent or able by others, receiving recognition or respect from others) (Hellriegel et al, 1998), and lastly, at the highest end of the hierarchy were self-Actualization or self-fulfillment needs (ex. doing the thing that one is ideally suited for to become everything that one is capable of becoming) (Maslow, 1954).

**McClelland’s Learned Needs Theory**

David McClelland (1966) believed that individuals in a certain society learn what is important for them to succeed from others in their own society or reference framework, and that societies differ in the emphasis placed on a variety of values. Individuals seek to satisfy the needs that are most important to them. He wrote about his observations of three
different internal needs or drivers which seemed to be present in societies, and in employees tested in a number of organisational settings, which had originally been described by Murray (1938): The need for Achievement, the need for Affiliation, and the need for Power. Of these, McClelland felt that the need which is most linked to high performance and motivation in an organisational setting was the Need for Achievement. Those having the need for achievement are motivated by “doing better”. They set moderately difficult, but potentially achievable goals for themselves, where they objectively have only about a 1-in-3 chance of succeeding…always setting challenges for themselves, tasks to make them stretch themselves a little.” (McClelland, 1986, p. 274)

People with a high need for Achievement have been observed to behave in this way (i.e. setting stretch goals) when they themselves can affect the outcome by their own efforts, preferring to “work at a problem rather than leaving the outcome to chance or to others” (ibid, p. 274). In this way, people with a high need for Achievement can be said to be internally motivated, by a desire to “beat their own personal best” as it is said in the sports world.

**Hertzberg’s Hygiene-Motivators Theory**

Hertzberg contributed a two-part content theory of motivation which distinguishes between lower level needs on the job, such as salary, working conditions, interpersonal relations with the boss, safety, benefits, etc. which he called “hygiene factors”, all extrinsic to the individual, as opposed to true “motivators” which are intrinsic elements derived from interesting, stimulating and challenging work (Hertzberg, 1968; Gibson, Ivancevich & Donnelly, 2000). In his view, the extrinsic parts of the motivation equation, such as salary, benefits, etc. are only useful in so far as they produce short-term actions or movement on the part of employees, whereas the intrinsic motivators were capable of
producing longer-term, more enduring movement forward. Using “hygiene” factors to produce movement forward is more demanding on managers’ time and on organisational resources as they require “constant reinforcement” (Hertzberg, 1968). For instance, in the case of giving a $1000 bonus this year, I must give a higher bonus next year if I hope to inspire the same efforts from the employee. True motivators in Hertzberg’s view include: “achievement, recognition for achievement, the work itself, responsibility and growth or advancement”. (Hertzberg, 1968; 1998)

Alderfer’s Existence-Relatedness-Growth (ERG) Theory

In order to provide an alternative theory to Maslow’s theory, Alderfer established a 3-fold theory system describing human needs, also placed in a hierarchy: existence, relatedness and growth (ERG). Unlike Maslow, Alderfer did not see the satisfaction of lower level needs as a necessary precondition for the satisfaction of higher order needs. Maslow’s needs were considered to be contained in each of the ERG areas. Existence need, similar to Maslow’s physiological need level and safety need level, fulfills the basic needs (food, water, shelter, money, working conditions), as discussed in relation to employee motivation by Gibson et al. (2000). Relatedness describes the human need for belonging to a social group and feeling accepted and loved/liked by members of the group, similar in fact to Maslow’s description of self-esteem needs (Alderfer, 1969; Gibson et al. 2000). Lastly, the growth need combines Maslow’s self-esteem and self-actualization into one, which encompasses our needs to use our creativity to make contributions to our organisations.
Table 10: Comparison Table of Content Motivation Theories with FIRO theory of interpersonal behaviour (Schutz).

<table>
<thead>
<tr>
<th>Murray</th>
<th>Maslow</th>
<th>McClelland</th>
<th>Hertzberg</th>
<th>Alderfer</th>
<th>FIRO Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Self-Actualization</td>
<td>Power</td>
<td>Intrinsic Motivators</td>
<td>Growth</td>
<td>Inclusion &amp; Affection</td>
</tr>
<tr>
<td>Achievement</td>
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<tr>
<td>Affiliation</td>
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<tr>
<td>Safety</td>
<td>Physiological</td>
<td></td>
<td>Extrinsic-Hygiene Factors</td>
<td>Existence</td>
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**Process Theories**

These models are used to understand the interplay of personality, individual values, background, education factors, etc., all factors which are contained individually within each person, to result in certain types of work-related behaviour (Hellriegel, et al. 1998).

Although there are very many process theories in the literature, we choose to present here the three process theories of motivation that underlie most clearly the CANE/ MST theory used in this study: these are Expectancy Theory, Goal-Setting, and Social-Cognitive Theory.

**Expectancy Theory**

A widely accepted process theory was Vroom’s (1964) Expectancy Theory, which considered the cognitive process an employee uses to rationally choose between various job behaviours and the expected outcomes and the value placed on each outcome. The model states that “people are motivated to work when they expect to achieve things they want from their jobs” (Hellriegel, et al. 1998, p. 153). A person engages in a rational process of choosing those behaviours that lead to desired outcomes and likewise, avoids any behaviours that are believed to lead to undesired outcomes. It states that motivation is
a multiplicative function of three basic constructs of the theory: valence, instrumentality and expectancy, which are defined as follows:

**Valence**: a person’s preference for realizing or achieving a certain outcome, or similarly, the person’s anticipated satisfaction from achieving a certain outcome

**Instrumentality**: a person’s confidence or belief in the relationship between what he does and the resulting outcome, i.e. that if Action A is necessary to achieve Outcome B, a person who has valence for Outcome B would want to do Action A in order to achieve B, and thus, this Action A is perceived as having High Instrumentality to this individual in this situation.

**Expectancy**: A person has a belief that a “particular level of effort will be followed by a particular level of performance” (Hellriegel et al. 1998, p. 155) Example: a salesperson believes that by making 100 sales calls, he/she can expect to close 10 deals. If he/she has valence for doing this, and making the calls is believed to be instrumental to achieving the 10% closure rate, then this person will also have high expectancy in this behaviour and will be highly motivated to make the 100 calls.

**Goal-setting theory**

Locke and Latham (1991) developed a goal-setting model of motivation which stated that “a goal serves as a motivator because it causes people to compare their present performance with that required to achieve the goal...when people believe they will fall short of a goal, they will feel dissatisfied and will work harder to attain the goal so long as they believe that it can be achieved.” (Hellriegel et al. 1999, p. 176) Other researchers showed that “goal specificity, goal difficulty and goal commitment each served to enhance task performance” (Steers et al, 2004, p. 382). Thus, there seems to be a good reason for the inclusion of “clear goals and objectives” as a necessary condition for the emergence of
high performing teams, as cited often in the team literature (McGrath, 1986; Hackman, 1990; Katzenbach & Smith, 1993; Levi & Slem, 1995). Setting clear goals and objectives is an activity that cannot be neglected in any type of work group, and requires the exercise of Expressed Control, in FIRO Theory, where an individual asserts their own view of what is needed to be accomplished, and imposes some form of structure on the group’s activities (Schnell & Hammer, 1997). The setting of clear goals and objectives by the leader is evaluated in the current study as part of the motivation variable under study, and thus is incorporated into the motivational measurement used.

**Self-Efficacy / Social Cognitive Theory**

The social cognitive view of motivation states that individuals are impacted by three interacting influences of behaviour, personality (including cognition and other personal factors) and environmental factors (Bandura, 1997 p. 6). Bandura’s concept of “self-efficacy” explains how people perceive “their capabilities for effective action in specific behaviour episodes” (Ford, 1992, p. 169) and this concept is still viewed as “the motivationally most decisive process in terms of regulating what a person actually does” (ibid., p. 170). Self-efficacy “has been found to have powerful motivational effects on task performance” (Latham & Locke, 2004, p. 388). Bandura’s theory also incorporated the most central elements of Locke and Latham’s goal-setting theory. Self-efficacy equates to an individual’s belief in their own ability to act, and is also termed “personal agency” (Ford, 1992; Clark, 1998)

**Extending Self-Efficacy to Group Efficacy**

Many researchers, building upon Bandura’s theory of self-efficacy support the idea that the elements that promote intrinsic motivation at an individual level, i.e. meaningful work,
responsibility for outcomes and knowledge of results (accurate feedback), are also applicable to teams as a whole (Pintrich & Schunk, 1996; Bandura, 1997; Hackman, 2002). A group may also be motivated by their collective belief that they are capable of achieving their goals (Guzzo et al., 1993) and empirical evidence attests to the “strength of this motivational belief...to predict group effectiveness in customer service and other domains.” (Guzzo & Dickson, 1996, p. 314)

Bandura (1997) provided a two-part definition of group motivation: (1) the degree to which members feel confident that the collective skills of group members are adequate to achieve the group’s assigned tasks; and (2) the degree to which group members believe that the group will be able to collaborate effectively to achieve its goals. Bandura (1997) further describes measures of group efficacy, defined as the group’s “belief in their conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment”. The point of reference which distinguishes Bandura’s examination of efficacy, is that the group is central, not the individual. In order to measure “collective efficacy”, individuals in the group are asked to rate their group (not themselves) on efficacy, and these ratings are then aggregated (Bandura, 1997). This is the approach taken in the current study. Additional research was done building upon Bandura’s framework of collective efficacy, but elaborated to include 4 elements: task-work ability, task-work motivation, team-work ability and team-work motivation. (Weaver et al., 1997). Group perceptions of efficacy were found to be significant in determining other group outputs, including performance in a laboratory-simulation looking at collective efficacy (Moss, 1998). In the current study, perceived group efficacy (collective efficacy) is constructed of group perceived ability to collaborate on tasks and ability to
coordinate tasks, based on Bandura’s descriptions as well as on the further development of MST and CANE Model (Ford, 1992; Clark, 1998) described below.

**Integrative Motivation Models Applicable to Current Study**

The addition of a fourth category of research may be added as there seems to be a long-standing need for a new kind of motivation theory which can bridge the many schools of thought on the subject of motivation (Ford, 1992, Latham & Locke, 2004; Steers et al. 2004; Steel & Konig, 2006). These authors cite a pressing need for “developing more complex theories of work motivation that are more valid, more complete, broader in scope and by implication, more useful to practitioners than existing theories.” (Steers et al. 2004, p. 384). Latham & Locke (2004) noted that there has been an “urgent need” for many years to integrate both content and process theories of motivation into more practical models which may be used in empirical research.

Other recent doctoral researchers have attempted to measure group motivation applying popular and well-known models such as Maslow/ Hertzberg Needs Theory (Moore, 2008); Expectancy Theory (Allen, 2005) or Goal-Setting Theory (Yu, 2005). There are drawbacks to using a single motivational theoretical model in modern team motivation research however. Problems stem from the fact that individual motivation theories such as reviewed above do not take into account additional elements affecting motivation when we work in teams (Clark, 2003). For example, issues of collective efficacy /group potency (Bandura, 1997; Hardin, Fuller & Valacich, 2006), as well as the degree of respect one has for the expertise of others in the team, degree of “social loafing” occurring in the team and belief in the team’s ability to collaborate successfully (Clark 2003) are all important elements of team motivation (Clark, 2005). However, these group motivational elements are not included in any other earlier individually-focused motivational theories. For
instance, both Maslow and Hertzberg proposed highly individualistic theories (Steers et al. 2004) and applied their models to the needs and motivators of workers as individuals. Although Expectancy Theory is often cited as a useful framework for exploring motivation, there is a declining interest in using the theory as a basis for empirical research, stemming from difficulties in defining and measuring some key constructs (Ambrose & Kulik, 1999). For instance, in trying to predict “choice” or “amount of effort” an individual will expend, there is little agreement of how to define these terms because they are defined subjectively by each individual, and are thus difficult to measure reliably (Ambrose & Kulik, 1999).

For the purpose of the current study, our objective was to use a business practitioner-friendly tool, and sought a practical integrative model and theory-based survey instrument that would be useful in discovering the status of motivation in the virtual teams in our study. Just such a practical model can be seen in the integrative work done by Ford¹ (1992) and contained within the Motivation Systems Theory or MST, which was further operationalized by the Clark² CANE (Commitment and Necessary Effort) model (1998).

The Clark CANE model forms the basis of the Group Motivation Questionnaire (Enciso, 2000), a research instrument to assess Group-Level Motivation, selected as the optimum tool for the current study. It is hoped that the integrative model by Clark, CANE (1998) will enable a fuller evaluation of level of motivation going beyond the limitations of other theories.

¹ Martin E. Ford is Professor of Education, Stanford University School of Education. Ford’s work focuses on motivational foundations of competence development, as well as basic and applied research on motivational processes in human development, education, counseling and business.

² Richard E. Clark, Professor of Educational Psychology and Technology at the University of Southern California (USC). His primary interest is in the design, delivery, management and evaluation of technology-based education and performance support systems. Clark has been described as the world’s most cited researcher in the area of media research design.
Motivational Systems Theory (MST)

Ford created the MST in response to what he saw as the “urgent need for a conceptual framework that addresses the lack of consensus, cohesion and integration in the field of motivation” (Ford, p. 244). Ford’s aim was to integrate the most important concepts from other theories seen to be of value to the motivation of adults at work, namely Locke and Latham’s (2002) Goal Setting Theory, Expectancy Theory (Vroom, 1964) and Self-Efficacy/Social Cognitive Theory (Bandura, 1997). The MST is a practical, utilitarian theory designed to “address real-world problems” (Ford, 1992, p. 15), an issue of great concern to business practitioners. Ford describes the MST theory (Ford, 1992, pg. 248) as containing the following component parts:

Motivation = Goals x Emotions x Personal Agency Beliefs

1. **Goals**: these are the individual’s thoughts about their own desirable (or undesirable) states or results that he/she seeks to attain (or avoid).

2. **Emotions**: these are “organized functional patterns consisting of an affective, physiological, and transactional components” (Ford, 1992, p. 252)

3. **Personal Agency Beliefs**: In the presence of challenging, but still attainable goals, the beliefs an individual holds about their capability or skill to achieve a goal, as well as whether their environment / context will allow them to achieve a goal.

The relationship between these three components is multiplicative; thus, if any one of the components is missing or negative, then motivation will be diminished. (Ford, 1992; Enciso, 2000).

Perhaps due to the fact that most motivation research has traditionally been carried out in university psychology departments using undergraduate students as “guinea pigs”, corporate HR and training decision-makers remain skeptical about the value of academic
motivation research. These managers would have trusted studies conducted in work settings with working adults; however, very little of the motivational research is in fact conducted this way (Clark, 1999). Yet, managers continue to grapple with real-world motivational issues with employees such as how to handle poor or under-performing workers. The current study aims to discover if there are behaviours in the areas of participation, control and personal support which virtual team leaders might apply to address similar motivational issues within their virtual teams.

**CANE (Commitment and Necessary Effort) Model**

Clark was one researcher who was concerned with solving real-world motivational problems and sought to address this gap by developing a “cognitive motivation model” to help managers solve motivational problems with their employees (Clark, 1999). Clark recognized that motivational problems at work stem from two main problems: 1) the worker fails to accept and actively pursue work goals, or 2) the worker fails to invest adequate effort once goals are accepted (Enciso, 2000). Clark developed a practical model, called CANE, Commitment and Necessary Effort, based upon Ford’s MST theory and Bandura’s Social Cognitive Theory, based upon the most applicable concepts of recent “cognitive performance motivation research” (Clark, 1998, pg. 40).

The CANE model, a cognitive motivation model, proposes that motivation is comprised of two inter-connected processes. These are described as:

**Phase 1: Commitment**

“We make a commitment to a performance goal which we will persist in achieving in spite of the temptations and distractions of pursuing other less important goals.” (Clark, 1998).
Three factors have been found to enhance (or diminish) commitment:

a. **Value**: My personal value in achieving the goal. Does the achievement of this goal make me more successful or more effective, or not?
   - Three types of value are important: utility value, interest/curiosity value and importance value (Eccles & Wigfield, 1995; Clark 1998)

b. **Emotion**: How do I feel about the achievement of the goal? Positive moods and emotions enhance motivation; negative ones diminish it.

c. **Agency**: Can I do this task? Will I be allowed to do it? If I answer positively to these questions, I will have a positive assessment of my own ability to successfully complete the task.

**Phase 2: Mental Effort**

This has been defined as “the number of non-automatic elaborations necessary to learn or solve a problem” (Salomon, 1984, p. 231). This phase is where a person decides the amount and quality of mental effort he will invest in achieving the goal. This is affected by the self-efficacy assessments of the knowledge / skills required to achieve a task.

These two elements of motivation, namely active and sustained pursuit of goals (commitment) combined with mental effort, are noted as being of primary interest in motivation research (Pintruch & Schunk, 1996). Accordingly, if the commitment is never made to achieve a goal, then it would be a natural consequence that no effort would be invested towards that goal; therefore effort follows commitment (Clark, 1998; Enciso, 2000). The Group Motivation Questionnaire (Enciso, 2000) used as Part 3 of the team survey instrument is designed to take into account the group motivational issues addressed by CANE and also incorporating elements of Collective and Self-Efficacy, Social Loafing and Goal-Setting, thus integrating the most relevant aspects of several useful motivational theories (Clark, 1998).
2.5.4 Motivation in Traditional Teams: the Leader’s Role

“Teams, like individuals, are motivated by whatever they believe will help them achieve their most important goals.” (Clark, 2005, p. 14). The key word here seems to be “believe”; it is important that a team believes in itself and its ability to work together to achieve those goals, in other words, its collective efficacy. The leader of the team can do much to foster this belief among team members. According to Clark (2005) there are five things a leader of a team can do to build team motivation:

1. Encourage mutual respect for the expertise of all team members
2. Help weaker team members believe that their effort is vital to team success
3. Support a shared belief in the cooperative capabilities of the team
4. Hold individual team members accountable for their contributions to the team effort (to overcome social loafing, measure and assess each team member’s contribution fairly and make it visible to all.)
5. Direct the team’s competitive spirit outside the team and the organisation. (Clark, 2005, p. 4)

In traditional teams, one of the major contributions the leader can make in a motivational sense is to make sure that feedback mechanisms are in place to give reliable and timely information to team members about their work, to maximize team learning (Matsui et al, 1987; Hackman, 2002;). This is another area where a team leader can actively seek to establish ways for his/ her team to get feedback, to process the feedback in a timely way, and to establish an atmosphere of trust or “psychological safety” where the members are able to make sense of feedback received and to learn from it. (Hackman, 2002) “Unless a team has data about how it is doing, there is no way it can learn. And unless a team learns, there is no way it can improve.” (Hackman, 2002, p. 103)
2.5.5 Motivation in Virtual Teams: The Leader’s Role

Motivation is often a challenge in virtual teams, given the conditions under which they are working and the lack of FTF interaction. Certain studies have reported on the frustrations of virtual team workers, and include commentaries about de-motivational aspects, including distance, lack of feedback from others, time differences, need to switch between normal business activities (co-located) and the virtual team task, or having to cooperate with people they did not know (Lipnack & Stamps, 1997; Lee-Kelley, et al. 2004). So called “high-intensity conditions” make it even more important for leaders to motivate team members to “commit strongly to the overall team effort” (Kerber & Buono, 2004; Horowitz et al., 2007; Malhotra et al., 2007).

Some writers have noted that getting individual virtual team members committed to the task of the team is like capturing market share, except that it is, in fact, capturing “mind share” or raising the level of priority that each member places on the team’s activities. (Gayeski, 2000). This is because virtual team members’ attention is often distracted or pulled away from the virtual task, in favor of more pressing matters closer at hand, that are in fact, much more visible, and perhaps more compelling (Klein & Kleinhanns, 2003).

Leader’s Inclusion Behaviours and VT Motivation

Given the distances, time gaps, and other disparities lying between members of virtual teams, the leader’s inclusiveness, i.e. his or her ability to bring members together, initiate and maintain contact, make virtual team members feel more “visible” and create a strong team identity, would seem to be pivotal to success (Malhotra et al., 2007; Hoefling, 2008). The first task of a leader, who is trying to establish a virtual team, is to get the members “in”, that is, to commit to being a real member of the team, handling the issue of Inclusion
in FIRO terms. Two other key inclusive behaviours seen as important to VT motivation in the literature are 1) recognition of accomplishments; and 2) facilitating team communication and knowledge-sharing.

Recognition of Accomplishments

Virtual team members can often feel invisible to the leader, because they are located far away (out of sight, out of mind) and often operate in a different time zone, and under different local business conditions. The team leader must try to make the team member more visible, both to the leader him/herself as to other team members. An effective behaviour is extending recognition or open praise of a team member’s contribution, so that all team members know what each person is doing and contributing. (Lipnack & Stamps, 2000; Kerber & Buono, 2004; Malhotra et al. 2007) An experienced virtual team leader in Pauleen’s 2003 longitudinal case study remarked upon the impact this type of behaviour has:

“To create virtual presence, I tried to get all the team members to know what everyone was doing. With most of these people, it was great. I felt it was important that those who did a good job be recognized, because it was a mindless task and they had no actual presence in the team. Otherwise they might feel, oh hell, I’m working my butt off, but nobody knows”. (Pauleen, 2003, p. 158).

A study of eight virtual teams in the IT industry revealed that the team member’s perceived recognition to be less than in FTF teams, but that recognition for successful virtual team-working influenced willingness to participate in future virtual teams. (Lee-Kelley et al, 2004). These authors reported too, that here the VT leader had to take a more structured approach to ensuring that recognition did take place, both between peers and superiors. This recommendation is echoed by Malhotra et al. 2007, who documented the
fact that by “keeping virtual team members in the corporate spotlight” in recognition of members’ current contributions, leaders could exert a positive effect on team members’ motivation to work on future virtual projects (Malhotra et al. 2007, p. 67). However, motivation was not a dependent variable in the Malhotra et al. (2007) study, as the study sample was selected highly effective virtual teams; thus the comments related to motivation may only be viewed as anecdotal, not empirically validated.

In other anecdotal evidence gathered from practitioners’ work with virtual teams, it is noted that by celebrating early successes of the virtual team, and recognizing extraordinary contributions by members team motivation and perceived effectiveness may be increased (Lipnack & Stamps, 1997)

A recent study of new product development teams shows that transformational leaders who recognize accomplishments of team members had a positive impact on motivation (Moore, 2008). Although the empirical evidence supporting the importance of recognizing accomplishment to VT motivation is not abundant, it is quite clear that leaders must take the initiative to communicate to others about these successes and contributions. When recognition is offered *publicly*, in view of all other members of the team, the leader is Expressing Inclusion in terms of FIRO theory (Schnell & Hammer, 1990). This aspect of behaviour is captured within the Perceived Leadership Behaviours portion of the survey instrument (see p. 101).

*Facilitating Team Communications and Knowledge-Sharing*

The VT leader plays the role of facilitator of team interactions, and must encourage team members to communicate frequently and continuously, since there are so few
opportunities in the virtual environment to see each other informally in the hallways or by the coffee machine, exchanging latest information, insights and questions with each other—this activity must be accomplished through informal “checking in” type of phone calls between VT members. The leader can do much to encourage VT members to do this. These informal exchanges help save time during the formal meetings and “avoid misunderstandings or conflicts that slow the collaborative process” (Klein & Kleinhanns, 2003, p. 394). Some teams made a point to schedule these “coffee machine” meetings, or informal conversations or to initiate spontaneous exchange of thoughts on particular problems by instant messaging to reinforce team members’ sense of engagement (Lee-Kelley, et al., 2004; Malhotra et al., 2007) which helped greatly in promoting smoother relations. Cummings found a linkage between frequency of leaders’ informal communication and team performance (Cummings, 2008). In a study of virtual student teams, effective leaders were seen taking the initiative frequently, “contacting members promptly..responding quickly to questions and comments that team members had” (Kayworth & Leidner, 2001, p. 22) which is an illustration of Inclusive Leadership at its best. The current research fills in the gap in our existing empirical knowledge of the measured correlation between a distinctive set of leader’s participative behaviours on the motivation of operational, real-world business teams operating virtually.

**Structuring Behaviours: Impact on VT Motivation**

*Clarifying Goals*

In a review of findings related to goal-setting in traditional teams (Ambrose and Kulik, 1999), much evidence is found as to the advantage of having clearly set, “specific and difficult goals” as opposed to “generally stated goals (such as “do your best”) or no goals” (Ambrose and Kulik, 1999, p. 246). Performance in teams increased when the goals were
specific and difficult, but commitment to the goals increased when people on the team participated in goal setting or set goals for themselves (Latham and Locke, 1991). Thus, there seems to be a good reason for the inclusion of “clear goals and objectives” as a necessary condition for the emergence of high performing teams, as cited often in the team literature (McGrath, 1986; Hackman, 1990; Katzenbach & Smith, 1993; Levi & Slem, 1995).

In the case of virtual team-working, clear goals and objectives are no less important. This was borne out by a recent study which found that virtual product development team’s motivation increased in proportion to the leaders’ clarification of their goals (Moore, 2008). Virtual teams rely upon clarity of purpose and goals, particularly when they seldom meet face-to-face, as this becomes “an invisible tether that yokes together the actions of far-flung team members” (Davis, 2004, p. 53). Virtual teams, according to Davis (2004) should “have a clear understanding of why they were formed and what they are expected to achieve” (Davis, 2004, p. 53)

When a virtual team is charged with a complex, highly interdependent task, it is vitally important for the leader to communicate to team members an urgent compelling challenge “that energizes the team to overcome the difficulties of spatial distance and technological mediation” (Kerber & Buono, 2004) that the VT will inevitably face in its work. This is synonymous with defining key performance objectives that require teamwork, as identified by Katzenbach & Smith, (1993). However, role definitions should not be too tightly or narrowly defined, rather serve as suggestions or guidelines so that the virtual team member can adjust to changing conditions. The virtual team leader can best maintain the clarity in the team’s tasks by “setting, measuring and monitoring goals” (Davis, 2004,
Anecdotal evidence from exploratory studies of effective virtual teams shows that of the most effective leaders would use their face-to-face meetings held at the outset of the virtual team’s existence to clarify goals, team purpose and outline a compelling challenge. In this way, the leaders facilitate “buy in” from team members, leading to higher commitment to team objectives (Lee-Kelley et al., 2004; Kerber & Buono, 2004; Malhotra et al., 2007).

In addition, it is vitally important that the leader clarify expectations related to participation in group meetings, preparation for meetings, punctuality, timeliness of inputs and giving feedback to each other (Klein & Kleinhanss, 2003). The leader must make efforts to enroll team members fully to get their agreement to these team ground-rules at the beginning of the virtual team project or activity, preferably in face-to-face conversations (Lipnack and Stamps, 1997).

The importance of this leadership activity was described by a virtual team member surveyed in the study done by Klein & Kleinhanss (2003):

“It just needs to be laid out really specifically, and I don’t think it ever has been really laid out. I’m not certain that it was made crystal clear that this is the expectation of being on this team: “This is what we require of you, and if you cannot make that commitment, maybe you shouldn’t be on the team.” Whereas we might rely on informal and real-time communication mechanisms with the local team, you can’t rely on those same mechanisms with the virtual team. You have to have more formal mechanisms, more structured meetings, and that kind of thing”. (Gibson & Cohen, 2003, p. 393.)

In the Kayworth and Leidner study (2001) “effective leaders did a better job of clarifying roles…low-performing leaders were not authoritative enough, not clear on responsibilities, not involved with the group…or did not follow-up” (p.22). Additionally, communication of goals, which is linked to Expressed Control or Structuring Behaviours in the current study, was instrumental to group motivation. “Effective leaders were good at
communicating direction… providing clean and precise outlines of goals” (Kayworth & Leidner, 2001, p. 22).

Thus, it would appear that clarification of goals is of equal or greater importance to effective leadership of virtual teams. Goal clarification and direction setting behaviours discussed above are embodied within the Expressed Control dimension of behaviour described by FIRO Theory and thus will be included in the measurements of perceived leadership behaviour taken in the current study (see p.102).

*Managing performance (task)*

Given the distance and time differences that virtual team leaders face, managing performance is more difficult for virtual team leaders, and thus, there is a need for greater structure and routine (Lipnack & Stamps, 1997; Kerber & Buono, 2004) to provide supplementary mechanisms to overcome these gaps of distance and time. However, these structures and routines must not create a sense of “micromanaging”, where this would be demotivational. Some examples of structuring routines employed by the leader of a virtual training and development team studied by Kerber and Buono (2004) include weekly conference calls, one-on-one telephone meetings between the leader and each team member every two weeks, evaluation of project objectives against work activity, client satisfaction and business results (p. 7). Some leaders of virtual teams, as in this particular team, have found that breaking down the team task into smaller sub-tasks, is an effective way to ensure closer monitoring of team task, plus a way to enhance team commitment and the quality of leader-team member communication (Kerber & Buono, 2004).
It is very important for virtual team leaders to keep a watchful eye out for “slacking” behaviour, i.e. when one team member does not fulfill expectations of the leader and other team members related to task completion or following the team ground-rules or protocols discussed above. “Unfortunately, it takes only one team member to derail a meeting or become a bottleneck to the team’s progress” (Klein & Kleinhanns, 2003). The impact of a leader not handling poor performance in the virtual team setting is enormous and will lead to break down of respect, trust, commitment and eventually affect motivation on the team (Handy, 1995; Klein & Kleinhanns, 2003). The evidence for the negative impact of “social loafing” on group motivation is well-known (George, 1992; Clark, 1998; Enciso, 2000) and since virtual teams are dispersed and difficult to monitor as we have mentioned earlier, there is an increased opportunity for this type of poor performance to carry heavy consequences for team performance. This element of the motivation puzzle is also accounted for in the Group Motivation Questionnaire (Enciso, 2000) used as part three of the team survey instrument in the current study (see appendix 3 for survey questions).

A leader is also needed to monitor external, environmental changes, such as changes in deadlines, changes in task specification, changes in team goals, organisational focus, so that they can interpret these external changes and how they may impact the team’s functioning (Bell & Kozlowski, 2003).

*Empowering:*

This is defined by Yukl et. al (2002) as “delegating and providing more autonomy and discretion to subordinates. (p. 21) and is believed to be likely to increase followers’ commitment to implement decisions full-heartedly. In cases where the team member has greater knowledge or skill than the leader, or in emergency circumstances where
conditions are shifting rapidly, particularly, “empowering” could be seen to improve the quality of decisions made or actions taken (Yukl, et al. 2002). Autonomy and empowerment have been linked to higher performance, commitment and satisfaction among traditional self-managed teams (Cohen & Bailey, 1997). Hackman believes it is very important for leaders to design work for teams that is meaningful and significant, in order to maximize motivation, giving them responsibility for a whole task, the more challenging and significant the better. “Collective internal motivation also is fostered by team tasks that provide members a large measure of autonomy to decide how they will use their human and material resources in carrying out their work”. (Hackman, 2002). Empowerment, as a variation on other motivational constructs, has been researched in virtual teams by Kirkman et al. 2004, although their construct is broader than Yukl and Hackman describe here, and incorporates more psychological elements than purely task-decision level constructs.

A leader’s propensity to delegate meaningful task responsibility and autonomy to team members would seem to be doubly important when leading virtual teams, given the geographical dispersion of team members. In virtual team settings, delegation of decision-making to team members could be a way in which the leader’s trust in team members is reinforced, and therefore, may be linked to motivation and commitment (Bell & Kozlowski, 2002; Tyran, Tyran & Shepherd, 2003) The current study aims to evaluate linkages between virtual team leaders’ Perceived Expressed Control behaviours and team members’ perception of their own decision-making autonomy, which is included in the Motivation measurement.
**Supportive Behaviours Impact on Motivation**

In virtual teams, without the benefit of frequent informal face-to-face encounters with the leader and other teammates, it is common for team members to suffer from feelings of isolation, frustration and lack of motivation during difficult times. The particular strains that are caused by working remotely, including “unclear direction and expectations, time pressure, cultural and language differences..as well as isolation.”(Davis, 2004, p. 49) suggest the vital importance played by a supportive, encouraging and mentoring leader. A recent empirical study of virtual team leadership by Moore (2008) found that transformational leadership as well as elements of LMX leadership, i.e. individualized attention, creating a supportive environment, developing close relations with team members, was related to emergence of team motivation in new product development teams. Other findings from recent doctoral research (Allen, 2005) into the motivation of virtual teams and impact of leadership behaviours also indicated that leadership behaviour is significant in affecting the level of motivation experienced by virtual teams, and that one leadership behaviour in particular, “supportiveness” was significantly correlated with virtual team motivation. This study was carried out within one large U.S. automotive manufacturing firm, with 274 virtual team members in 45 virtual teams spread out across the U.S. This is the only study which examined motivation of virtual teams specifically, as related to leadership behaviours. In the current study, the subjects are working for globally-based virtual teams, spread out across many different countries and time-zones, and therefore, it will be interesting to test whether “supportive” behaviours as described in the set of ten expressed behaviours of FIRO Theory are equally linked to motivation.

**Showing Appreciation and its Impact on Motivation**
This is defined by Yukl et al. (2002) as “giving praise and showing appreciation to others for effective performance, significant achievements, and important contributions to the organisation.” (p. 21). Yukl et al.’s taxonomy of leadership behaviours (2002) “emphasizes recognition because it is easier to provide than tangible rewards, it is more personal, and it is relatively independent of the formal reward system of the organisation”. (Yukl et al., 2002, p. 21). Furthermore, there are clear linkages between recognizing and effective leadership, gained through descriptive studies (Peters & Austin, 1985; Kouzes & Posner, 1995) as well as links between recognition and subordinate performance, where the manager’s praise of an individual increased that person’s performance significantly (Wikoff, Anderson, and Crowell, 1983). The relevant FIRO interpersonal behaviours related to this dimension are Expressed Inclusion and Expressed Affection (Schutz, 1958; Schnell, 2000; Siegel et al., 2001). In light of these findings, there would seem to be justification here for the value in exploring the impact of Recognition/Appreciation, as seen in Expressed Inclusion and Affection, upon motivation of teams, particularly virtual teams.

2.5.6 Motivation and VT Effectiveness

In research on traditional teams, some research points to a linkage between team motivation and performance (Hackman & Oldham, 1980, Kirkman & Rosen, 1999). One study dealing with these specific variables in a virtual setting showed a positive relationship between team empowerment, a concept similar in many respects to motivation as used in the current study, and team performance outcomes, notably process improvement and customer satisfaction (Kirkman, Rosen, Tesluk & Gibson, 2004, pg. 182). The concept of motivation, as used in the current study encompasses many of the aspects of “team empowerment”, which is described as a “dynamic motivational
construct” (Kirkman et al., 2004, pg. 177) According to Kirkman et al. empowerment has four dimensions:

- Potency: The team believes in its effectiveness as a group;
- Meaningfulness: how much do the team members care about their tasks
- Autonomy: team members perceive that they have freedom to make decisions;
- Impact: team members perceive that their task makes a positive difference to the organisation.

Clark’s (1998) CANE model includes all of these aspects: the potency element is found in the group effectiveness sub-component of mental effort; the meaningfulness element is found in the emotion sub-component of commitment; the autonomy element is found in the agency sub-component of Commitment; an impact element is found in the agency sub-component of commitment (See Appendix 4). Thus the Kirkman et al. (2004) study found some positive relationships between virtual team empowerment (motivation) and on team performance outcomes of process improvement and customer satisfaction, both of which are included as sub-elements in the Gibson et al. (2003) measure used in the current study to measure team effectiveness (See Appendix 3). The current study will investigate the relationship of motivation on virtual team effectiveness as this relationship has never before been tested empirically within the setting of operational virtual business teams.

2.6 Cohesiveness

2.6.1 Cohesiveness in Traditional Teams

The ages-old expression that “birds of a feather, flock together” describes the concept of cohesion, or the degree to which “members of a group are attracted to other members and are motivated to stay in the group” (Bettenhausen, 1991; Festinger, et al., 1950). Cohesiveness implies, (as in the ancient Aesop’s fable, wherein the bundle of sticks does
not break as easily as the single twig) that “unity gives strength”. Accordingly, some researchers have defined cohesiveness as “the resistance of the group to disruptive forces” (Gross & Martin, 1952, p. 35). A cohesive team is a tightly unified force to be reckoned with, is more resistant to stress and destructive forces, and as such would seem to be desirable to have and maintain in a virtual setting. The concept of “cohesiveness” is a multi-dimensional construct, containing elements of social participation and belonging, as well as task-related dimensions, such as the team’s goal or objective (Festinger et al., 1950; Zaccaro & McCoy, 1988). The three components of Cohesiveness as a multi-dimensional construct were:

- Interpersonal attraction: a team member’s attraction to other team members
- Group pride: feeling of pride in the group’s prestige, loyalty to group, etc.
- Task commitment: team members’ dedication to goals of the team/group.

(Driskoll, Radtke & Salas, 2003)

2.6.2 Cohesiveness in Virtual Teams

In virtual teams, given the three elements of cohesiveness discussed above, i.e. interpersonal attraction, group pride and task commitment, and the fact that virtual teams must interact primarily using CMC technologies, one might likely expect to see a weakening of group cohesion in virtual team settings. Among difficulties unique to virtual team settings, mentioned earlier, are lack of face-to-face cues, lack of informal time for informal coffee-cooler types of interactions, thus limiting time available for relationship building and perhaps negatively impacting social cohesion in the team (Driskell et al. 2003). There has been some recent empirical research on cohesiveness in virtual settings: Virtual team cohesiveness was shown to increase when team members are given relational training, to build the team members’ ability to create strong relationships virtually.
(Beranek & Martz, 2005). A study of eight virtual teams in a university setting investigated the impact of sub-groups on the emergence of group cohesiveness, finding that breaking the team into sub-groups did not have a consistent effect on cohesiveness (Panteli & Davison, 2005). Two recent studies of virtual teams working in a laboratory-setting on a team task found that the virtual teams were less cohesive than FTF teams (Hambley et al., 2007; Balthazard, Waldman and Atwater, 2008). An earlier study of fifty virtual teams of MBA students found that the time available for communication and immediacy was linked to cohesiveness (Knoll, 2001).

2.6.3 Virtual Team Cohesiveness: The Leader’s Role

Leaders provide the “human link” in the virtual environment; i.e. to coordinate and build relationships among virtual team members..to bridge all the holes found in virtual communications” (Klein & Kleinhanns, 2003, p. 396). From exploratory case studies as well as from anecdotal evidence from those working as consultants with virtual teams, we know that leaders can do many things to build a cohesive team. Such activities as 1) establishing norms for working together; 2) establishing a team logo or team identify; 3) facilitating group interaction; 4) socializing and integrating new members; 5) setting clear, compelling goals (Kozlowski et al., 1996; Lipnack & Stamps, 1997; Duarte and Snyder, 1999, Durnell, Cramton & Orvis, 2003; Gibson & Cohen, 2003, Kerber & Buono, 2004).

However, here is not a wealth of empirical studies looking specifically at leadership behaviour and its relationship to virtual team cohesiveness. The very recent work by Joshi et al. is interesting in that it revealed leaders’ impact on team commitment (2009). This study found that inspirational leaders, described as those who build “socialized relationships” with team members as opposed to “personal relationships”, and who
develop a “collective identity in the team by using a collective message” (Joshi et al. p. 241), were found to contribute to virtual team members’ commitment to the team (Joshi et al., 2009). Joshi et al. define “team commitment” as “the identification with and affective attachment to the team” (2009, p. 241) which comes fairly close to the definition of cohesiveness we use in the current study. The Joshi et al. study is the only empirical study with operative corporate teams to date that revealed linkages between leadership and a construct resembling cohesiveness. As we see, there is not much evidence so far linking leadership behaviours or action to team cohesion, a gap which the current research seeks to address.

**Leaders’ Inclusion Behaviours and VT Cohesiveness**

Joshi et al. (2009) found that socialized relationship-building by inspirational leaders, such as 1) communicating a compelling vision/clear goals; 2) expressing confidence in team members; and 3) energizing team members with enthusiasm, increased team commitment (similar to cohesiveness) & team trust. In all three of these behaviours can be seen commonalities with Inclusion as described in FIRO theory. In a laboratory-setting, Hoyt and Blascovich found a relationship between Transformational Leadership, particularly “individualized attention”, and group cohesiveness (Hoyt & Blascovich, 2003). It is possible that this aspect of Transformational Leadership also contains FIRO elements of Inclusion and Affection combined, although this linkage has never been tested experimentally. Beyond these two studies, to this researcher’s knowledge, there is no other empirical research done to test the relationship between leadership and group cohesiveness. Therefore, the current research aims to address this gap in our knowledge, particularly pertaining to leadership behaviours and virtual team members’ perception of group cohesiveness.
Leaders’ Structuring Behaviours and VT Cohesiveness

Some recent research has tested the impact of structuring behaviours, particularly goal clarification or goal-orientation on cohesiveness in FTF teams (Yu, 2005), which found a linkage between the leader’s goal orientation and group cohesiveness. Goals are among the important leadership behaviour contained in Inspirational Leadership, as described by Joshi et al. (2009) i.e. communicating a compelling vision/clear goals which played a role in increasing team commitment (similar to cohesiveness) & team trust. Task commitment has been mentioned as an important component of team cohesiveness in traditional teams (Zaccaro & McCoy, 1988; Mullen & Cooper, 1994). Furthermore, a focus on the task has been found to be a unifier of highly diverse teams in a traditional team-setting (Knouse, 2006). Thus, it might be expected that a VT leader’s structuring of the task, i.e. exhibiting a high degree of goal-orientation, communicating with high degree of clarity about the roles, responsibilities, working methods and expectations for outcomes would have an impact on team cohesiveness. The current study aims to clarify what, if any, relationship exists between the virtual leader’s structuring behaviours (termed as Control within FIRO Theory) and perceived virtual team cohesiveness.

Leaders’ Supportive Behaviours and VT Cohesiveness

Virtual team managers are able to do many things to build the “emotional bandwidth” of their teams to increase the feeling of cohesion, amongst others taking action to ensure that strong relationships form among team members (Hoefling, 2008). Hoefling writes from anecdotal evidence in her consulting practice with virtual teams, that leadership activities that build a cohesive virtual team culture include (a) establishing a open, supportive team atmosphere, (b) coaching and encouraging learning (c) establishing positive team self-
image and identity and (d) encouraging informal information exchange around the virtual “water cooler” (Hoefling, 2008, p. 94-95). However, very little empirical, academic research with real corporate virtual teams has specifically measured the relationship between supportive behaviours and cohesiveness. Joshi et al. (2009) found that socialized relationship-building by inspirational leaders increased team commitment (similar to cohesiveness) & team trust. The relevant behaviours in the Joshi et al. study that have parallels to FIRO behaviours of Affection/supportiveness as well as Inclusion/participative behaviour would be 1) expressing confidence in team members; and 2) energizing team members with enthusiasm; however these parallels are conjectural and not borne out by empirical research.

In virtual student teams, Kayworth and Leidner (2002) discovered that leaders exhibiting supportive behaviours were viewed as “effective” in building “a healthy social climate for team members to interact with each other” (p. 27), although this study did not measure the outcome of “cohesiveness” per se. Hoyt and Blacovich’s laboratory study with undergraduate students (2003) found that virtual teams led by transformational leaders, those who showed “individualized consideration”, which includes both supportive and participative behaviours (Bass, 1990) showed higher levels of group cohesiveness. We expect to find a similar result when testing the relationship between supportive leadership behaviours and cohesiveness within operative corporate virtual teams in the current study.

2.6.4 Cohesiveness and VT Effectiveness

Cohesiveness has been linked to measures of organisational effectiveness and performance in several studies over the past couple of decades. Some relatively small correlations between cohesiveness and group performance were cited in two meta-analyses of the
subject (Evans and Dion, 1991; Mullen & Cooper, 1994). The conclusion of research conducted in business teams (Gully et al., 1995) was that cohesion was positively related to performance. Cohesiveness, measured as team commitment, or the “individual’s identification with and affective attachment to the team (Allen and Meyer, 1990, cited in Driskell et al. 2003) was found to be predictive of team performance (Driskell et al., 2003). In virtual teams, in contrast to FTF teams, the interaction between team members takes place using CMC, which may lead to “less intimacy and difficulty in establishing relationships among team members” (Driskell et al., 2003). Some researchers suggest that greater degrees of team commitment, such as embodied within the social cohesiveness construct, lead virtual teams to overcome the barriers of distance which separate them (Fiol & O’Connor, 2005). However, empirical research on cohesiveness and its effect on business team performance is in its infancy, and to our knowledge, this is the first study with real business teams which examines the relationship between these two variables in a virtual context.

2.6.5 Cohesiveness and VT Motivation

Research dealing with conflict and team process in virtual teams reports that a “shared identity” is highly motivating to team members to work towards team goals, building loyalty and concern for the welfare of the group (Hinds & Mortensen, 2005). Hinds and Mortensen further state that “when team members’ self-concept shifts from the “I” to the “we”, they will be more likely to pursue shared goals and behave in ways that are normative for their shared group identity and contribute to the team’s performance” (Hinds & Mortensen, 2005, pg. 292). A strong collective identity (group cohesion) has been suggested to be instrumental in motivating individuals to work towards team goals as opposed to working solely for the achieving of their own individual goals and rewards.
(Ellemers, De Gilder & Haslam, 2004). The relationship between cohesiveness and team motivation has not yet been tested empirically in virtual teams. The presence of such a collective identity would seem to characterize the cohesive team, and thus it may be expected that there is a positive relationship between cohesiveness as perceived by virtual team members and the outcome of team motivation in the current study.

2.7 SUMMARY OF LITERATURE REVIEW

Effectiveness and VT Leadership: Kerber & Buono’s 2004 case study explored team member’s perceptions of effective leadership, more than effectiveness as an outcome measured as a dependent variable, thus is limited in its direct implications for leadership effect on team effectiveness. The 2007 study by Malhotra et al. is more useful in establishing linkages between leadership action or behaviours in the six identified areas related to team effectiveness, as this was the only study where the sample was pre-selected by objective external evaluators for the team’s degree of effectiveness. Thus, we can draw linkages between participative, structuring and supportive leadership behaviours to team effectiveness. Cummings (2008) drew linkages between the degree of informal communication, falling in the participative leadership category, and the performance of the team, which could be seen as synonymous with team effectiveness.

Motivation and VT Leadership: Moore (2008) found that some elements of transactional, LMX and transformational leadership were positively related to new product development teams’ motivation, and that a combined “cocktail” of elements coming from all three of these popular leadership models are valuable in building motivation in this particular type of virtual team. Behaviours flagged as useful were inclusive (recognizing contributions), structuring (clarifying goals) and supportive (mentoring, creating
supportive environment, building close relationships with team members) although his study is limited by the measure of motivation that was used (Moore, 2008). Allen (2005) found linkages between the supportive leadership behaviours contained within Transactional/ Path-Goal Leadership Model and motivation of virtual teams. Although both studies measured the motivation of individuals on the team with surveys that used individualized-measures, it is interesting that these three areas of leadership activity were shown to have impact on motivation. No other empirical studies with leadership behaviours as the independent variable focused on motivation as a team outcome.

**Cohesiveness and VT Leadership:** The Joshi et al. study (2009) found evidence of linkages between the Inspirational Leadership set of behaviours, (i.e. communicating a compelling vision and reinforcing common goals of team; expressing confidence in team members and energizing team members with enthusiasm) and team commitment (related to Cohesiveness) and team trust. These three behavioural areas may reflect some elements of FIRO behaviours Inclusion, Control and Affection, although there is no empirical evidence of this linkage. In addition, Hoyt and Blascovich’s (2003) laboratory simulation with student participants showed that Individualized Consideration, a component of Transformational Leadership was associated with higher levels of group cohesiveness. It is proposed that Individualized Consideration implies similar behaviours as contained in Inclusion and Affection in the FIRO Theory, although these linkages are conjectural. (See Table 8 on page 32 for description of FIRO equivalents with aspects of the most widely researched leadership theories.)
Motivation and Effectiveness: Kirkman et al. (2004) found some positive relationships between virtual team empowerment (motivation) and on team performance outcomes of process improvement and customer satisfaction.

Cohesiveness and Effectiveness: Empirical research on cohesiveness and its effect on business team performance is in its infancy, and to our knowledge, this is the first study with operational business teams which examines the relationship between these two variables in a virtual context.

Cohesiveness and Motivation: A strong collective identity (group cohesion) has been suggested to be instrumental in motivating individuals to work towards team goals (Ellemers, De Gilder & Haslam, 2004). However, the relationship between cohesiveness and team motivation has not yet been tested empirically in virtual teams.

In conclusion, the literature reviewed here shows that although there is a growing body of research describing virtual team leadership and outcomes, there is relatively little empirical field research done with real business teams working virtually. Although a limited amount of field research with operative business virtual teams has revealed linkages between the virtual team leader’s Participative, Structuring or Supportive behaviours and effectiveness (Kahai et al., 1997; Kerber & Buono, 2004; Malhotra et al. 2007; Cummings, 2008), motivation (Allen, 2005; Moore, 2008), and cohesiveness (Hoyt & Blascovich, 2003; Joshi et al., 2009) there has to date never been an assessment of the complete set of FIRO-based behaviours in these three important inter-personal areas. There is also a noticeable paucity of knowledge in the area of motivation of virtual teams, particularly which show a motivational impact of Inclusion / Participation and Control /
Structuring leadership behaviour, otherwise reported by so many authors as having an impact on VT motivation (Bell & Kozlowski, 2002; Kayworth & Leidner, 2002; Klein & Leinhanns, 2003; Kerber & Buono, 2004). Table 11 below provides a snapshot of the linkages found in the empirical studies dealing specifically with each of the independent variables found within VT leader behaviours, related to the dependent variables in focus in the current study, i.e. Effectiveness, Motivation and Cohesiveness, as well as between the Dependent Variables, i.e. Motivation and Effectiveness, Cohesiveness to Effectiveness and Cohesiveness to Motivation.
<table>
<thead>
<tr>
<th>Leadership Behaviour</th>
<th>Relationship to Effectiveness</th>
<th>Relationship to Motivation</th>
<th>Relationship to Cohesiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INCLUSION/PARTICIPATION</strong></td>
<td>Cummings, 2008 informal communication</td>
<td><strong>Moore, 2008</strong> Transformational Leadership (Recognizing accomplishments)</td>
<td><strong>Joshi et al. 2009</strong> Socialized relationship-building by inspirational leaders increased team commitment (similar to cohesiveness)</td>
</tr>
<tr>
<td>Malhotra et al. 2007 meeting practices, information sharing, recognition of members’ contribution</td>
<td><strong>Joshi et al. 2009</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerber &amp; Buono, 2004 lavish information flow established by leader</td>
<td>Moore, 2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CONTROL/STRUCTURING</strong></td>
<td>Malhotra et al. 2007 -enforcing team norms for running meetings -monitoring progress</td>
<td>Moore, 2008 Transactional (Path-Goal) Leadership Defining clear goals</td>
<td><strong>Joshi et al., 2009</strong> inspirational leaders reinforcing common goals of team, increased team commitment (similar to cohesiveness)</td>
</tr>
<tr>
<td><strong>AFFECTION/SUPPORT</strong></td>
<td>Malhotra et al. 2007 -encouraging team -connecting personally</td>
<td>Moore, 2008 Transformational Leadership: Creating supportive culture; Individualized attention LMX Theory: providing team member encouragement; mentoring, supportive behavior</td>
<td><strong>Joshi et al., 2009</strong> inspirational leaders expressing confidence in team members, increased team commitment (similar to cohesiveness)</td>
</tr>
<tr>
<td>Kerber &amp; Buono, 2004 Building relationships with team members associated with perception of higher performance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MOTIVATION</strong></td>
<td><strong>Kirkman et al. 2004</strong> Team empowerment related positively to team performance (process improvement &amp; customer satisfaction)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>COHESIVENESS</strong></td>
<td><strong>Not tested.</strong></td>
<td><strong>Not tested.</strong></td>
<td></td>
</tr>
</tbody>
</table>
Chapter Three

RESEARCH HYPOTHESES

The current study aims to add to our existing knowledge about leadership behavioural patterns and their impact on virtual team motivation, cohesiveness and effectiveness. It is the intention of this researcher to investigate the acceptability of the hypotheses proposed below. (These are stated only in the positive form, although it is the null hypotheses which are later tested):

1. **A virtual team leader’s perceived behaviours in Inclusion, Control and Affection are positively related to higher levels of Group Effectiveness?**

   **HA1:** The perceived Inclusion (PeI) behaviours of the VTL are positively related to group effectiveness.

   **HA2:** The perceived Control (PeC) behaviours of the VTL are positively related to group effectiveness.

   **HA3:** The perceived Affection (PeA) behaviours of the VTL are positively related to group effectiveness.

   **HA4:** The combined level of expressed behaviour of the VTL (Inclusion + Control + Support) is positively related to group effectiveness.

2. **A virtual team leader’s (VTL) behaviours, as perceived by members of the virtual team, in Inclusion, Control and Support, have a positive correlationship with the team’s perceived Motivation.**

   **HA5:** The perceived Inclusion (PeI) behaviours of the VTL are positively related to perception of group motivation.

   **HA6:** The perceived Control (PeC) behaviours of the VTL are positively related to perception of group motivation.

   **HA7:** The perceived Affection (PeA) behaviours of the VTL are positively related to perception of group motivation.

   **HA8:** The combined level of expressed behaviour of the VTL (Inclusion + Control + Support) is positively related to group motivation.
3. A virtual team leader’s (VTL) behaviours, as perceived by members of the virtual team, in Inclusion, Control and Support, have a positive correlation with the team’s perceived Cohesiveness.

**Hₐ9**: The perceived Inclusion (PeI) behaviours of the VTL are positively related to perceived group cohesiveness.

**Hₐ10**: The perceived Control (PeC) behaviour of the VTL are positively related to perceived group cohesiveness.

**Hₐ11**: The perceived Affection (PeA) behaviours of the VTL are positively related to perceived group cohesiveness.

**Hₐ12**: The combined level of expressed behaviour of the VTL (Inclusion + Control + Support) is positively related to group cohesiveness.

4. A Virtual Team’s level of Group Motivation is positively related to its Effectiveness.

**Hₐ13**: The virtual team’s level of motivation is positively related to the group’s effectiveness.

5. A Virtual Team’s level of Cohesiveness is positively related to its level of Effectiveness.

**Hₐ14**: The virtual team’s level of cohesiveness is positively related to the group’s effectiveness.

6. A Virtual Team’s level of Cohesiveness is positively related to its level of Group Motivation.

**Hₐ15**: The virtual team’s level of cohesiveness is positively related to the group’s perceived motivation.
Chapter Four

METHODOLOGY

4.0 Introduction

This study aims to operationalise the FIRO Theory by building a practical measure of team members’ perceptions of the leaders’ expressed interpersonal behaviours, and to test whether these perceived levels of interpersonal behaviour are related in some ways to the team outcomes of interest. This chapter describes the research design strategy, research model, choice of appropriate measurements for each variable, the sample, on-line survey design, new questionnaire (i.e. operationalised FIRO B items in the Perceived Leader Behaviour Questionnaire) testing, pilot test, data collection and ethical considerations.

4.1 Research Design Strategy

As we have seen in Chapter 2, there have been several studies of VT leadership referring to leadership behaviours described by popular leadership models, i.e. Transformational Leadership, Transactional Leadership (Path-Goal) and LMX. Some of these leadership behavioural patterns have shown correlations to team outcomes such as trust, effectiveness, motivation and cohesiveness. However, a practical operationalisation of the FIRO inter-personal behavioural model has never before been explored in the virtual team context. As we endeavoured to seek a way to measure how team members perceived the expressed behaviours of their team leader, according to the FIRO model and the psychometric FIRO-B measure, it was necessary to build a new measurement tool, the Perceived Leader Behaviour Questionnaire, with the input of a panel of experts (see p. 100) as is known to be a valid method for generating new scales and verifying face and content validity (Wressle, Eriksson, Fahlander, Rasmusson, Tedemalm & Tangmark, 2006). This was the first concern in building an appropriate research design.
The quality of information gathered about the variables of focus in this study, i.e. leadership behaviours (inclusion, control, support) and team outcomes (cohesiveness, effectiveness, motivation) was of vital concern and a great deal of attention was paid to determining the right strategy for gathering this information in the most efficient and effective way. In order to get an accurate measure of the virtual team leader’s actual behaviour, team members were asked to give their assessment of their team leader’s actions as opposed to asking the team leader’s input about his/her own behaviour. Similarly, we chose to ask for objective input from the sponsor of each team, i.e. the team leader’s direct supervisor, to get an accurate measure of the team’s effectiveness, as opposed to asking for this assessment from team members or team leaders. The design of strong measures for each one of the variables was a critical concern, and where possible, we have utilized existing, previously researched measurements. Given that there are a number of factors which previous research has shown to have impact on team outcomes, and yet which are not examined by the current study, it was necessary to control for these factors to the greatest extent possible. These moderating factors include elements such as “number of face to face meetings”, “age of the team”, “sharing of common team objectives” (related to team interdependence discussed earlier) and “leadership” (i.e. is there one single designated leader, or is leadership shared?). These factors were built into the list of criteria for selecting teams, thus ensuring that the sample was as homogenous as possible. The bivariate correlational analysis of the six variables of this study took place as depicted in the research model (Figure 2) below.
4.2 Measurements

Leadership Behaviours (FIRO Framework)

As there had never before been a measure of perceived leadership behaviours as described by FIRO theory, this research sought to create a practical feedback survey to assess what team members perceived as visible leadership behaviours in the three key FIRO areas of inter-personal behaviour. Based upon the Expressed Inclusion, Control and Affection behaviours of FIRO-B psychometric assessment (Schnell & Hammer, 1997; Oxford Psychologists Press, 1997) thirty questions, 10 items for each sub-category, were proposed for the Perceived Leader Behaviour (PLB) portion of the questionnaire. In developing these questions, input was sought from the members of the expert panel who generously

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3 Experts selected to serve on the panel: Dr. Roger Pearman is senior author of I'm Not Crazy, I'm Just Not You, author of Hardwired Leadership, Enhancing Leadership Effectiveness, Leadership Advantage, Introduction to Type and Emotional Intelligence, Type 360°, an award-winning multi-rater instrument, and provides training on use of the MBTI and FIRO-B in leadership development for OPP and CPP, certifying organizations for FIRO-B in UK and USA. Dr. Henry L. Thompson, is an award-winning organizational psychologist and is widely known for his extensive achievements and research in Leadership, Cognitive Ability,
gave their feedback and suggested changes to the questions to a) avoid bias, b) simplify the language, and c) to ensure universal applicability. The new part of the questionnaire (part I, 30 new items) was assessed for content and face validity by a panel of four FIRO-B experts. The 30 validated questions were posed as declarative positively phrased statements, ex. “My team leader checks with me regularly to see how I am doing in my work”. A five-point Likert scale was used, with responses ranging from “never” to “always”. An additional open-ended question was included, (“Is there anything else, in your opinion, that your leader could do to improve the way the team works?”) in order to provide valuable qualitative feedback to the leaders following the survey.

Inclusion/Participative Behaviours

In order to provide an input to measure our first independent variable, Inclusion, a set of 10 questions was created to inquire: “To what degree does your virtual team leader exhibit participative behaviours?” These behaviours emphasise initiative-taking actions, where the VT leader encourages team members to become engaged in team activities, to share information with each other, and to participate in the team’s decisions, etc. The original set of questions from the FIRO B instrument were adapted to fit the virtual team working situation, based upon input from the panel of experts as well as from inputs following the pilot studies described in the earlier section.

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Emotional Intelligence, FIRO® Theory, and Psychological Type. **Dr. Eugene Schnell** is the author of several management development books that are based on an interpersonal relations instrument known as the FIRO-B, including *Introduction to the FIRO-B in Organizations*, *The Leadership Report Using the FIRO-B and MBTI*, and *Participating in Teams*, and was formerly a professor in the areas of leadership, negotiation, innovation with Johns Hopkins University (JHU) where he served as JHU’s Director of Organization Development and Diversity from 1998 until 2004. **Hafdis Thorsteinsdottir**, Organisational Psychologist; Director of Knowledge Center, Center for Leadership, Copenhagen Denmark, was primarily responsible for the translation and norming of the FIRO-B instrument for the Danish population.
Table 12 Inclusion/Participation Items

<table>
<thead>
<tr>
<th>Questions related to Expressed Inclusion: Independent Variable 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. My team leader asks me for my input, ideas, and suggestions regarding our tasks</td>
</tr>
<tr>
<td>9. My team leader takes the initiative to keep in contact with me.</td>
</tr>
<tr>
<td>11. My team leader keeps all team members fully informed about our team’s activities.</td>
</tr>
<tr>
<td>14. My team leader presents issues or questions for discussion in order to get input from all team members</td>
</tr>
<tr>
<td>15. My team leader invites me to take part in meetings</td>
</tr>
<tr>
<td>17. My team leader tries to incorporate team members’ suggestions into decisions</td>
</tr>
<tr>
<td>27. My team leader makes an effort to make members feel that their contributions are significant to the team’s success</td>
</tr>
<tr>
<td>29. My team leader encourages all of our team members to participate fully during our meetings</td>
</tr>
<tr>
<td>31. Whenever my team leader gets a new piece of information that might help us (team members), he/she immediately communicates with us</td>
</tr>
<tr>
<td>34. My team leader makes efforts to encourage all of us to exchange information with each other</td>
</tr>
</tbody>
</table>

Control/Structuring Behaviours

In order to provide an input to measure our second independent variable, Control, a set of 10 questions was created to inquire: “To what degree does your virtual team leader exhibit structuring behaviours?” These ten questions identify ways in which the leader exhibits structuring behaviours inter-personally, i.e. the VT leader exercises actions that place structure or promote structure within the team or among team members, as well as promoting his/her own ideas for what should be done. These questions indicate to what degree the leader takes the initiative to put structures in place, to achieve the team’s objectives and takes a “front-of-the-group” position in setting direction (as opposed to a “behind-the-scenes”, or laissez-faire style of leadership).
Table 13  Control/Structure Items

<table>
<thead>
<tr>
<th>Questions related to Expressed Control Behaviours: Independent Variable 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. My team leader establishes structured tasks, procedures and policies for the way I should do my work in the team</td>
</tr>
<tr>
<td>10. My team leader pushes the group to adopt his/her own ideas during team discussions</td>
</tr>
<tr>
<td>12. My team leader sets a clear direction for the team</td>
</tr>
<tr>
<td>16. My team leader provides clear guidelines for accomplishing my assigned tasks</td>
</tr>
<tr>
<td>18. My team leader directs the activities of the team</td>
</tr>
<tr>
<td>20. My team leader tries to influence the opinions of team members related to team activities</td>
</tr>
<tr>
<td>24. My team leader gives me clear directions to tell me what I should do</td>
</tr>
<tr>
<td>26. My team leader makes winning a priority for our team</td>
</tr>
<tr>
<td>32. My team leader makes efforts to establish his/her authority in team</td>
</tr>
<tr>
<td>33. My team leader checks with me regularly to see how I am doing in my work</td>
</tr>
</tbody>
</table>

**Affection /Supportive Behaviours**

In order to provide an input to measure our third independent variable, Affection/Support, a set of 10 questions was created to inquire: “To what degree does your virtual team leader exhibit supportive behaviours?” These ten questions identify ways in which the leader exhibits supportive behaviours inter-personally, i.e. the VT leader exercises actions that nurture, encourage, mentor, appreciate members of the team, in order to bring the team members into closer relationship with both the leader and with one another. The FIRO Theory holds that Affection behaviours, referred to in this study as “Supportive” behaviours (to avoid misunderstanding and ambiguity related to the word “affection” in the business-setting, as recommended by Schnell (2000) and Thompson (1995), play a large role in building intimate relationships and inter-personal bonding between individuals in groups (Schutz, 1958; 1976).
Table 14 Affection/Support Items

<table>
<thead>
<tr>
<th>Questions related to Expressed Affection/Support: Independent Variable 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. My team leader expresses personal appreciation for my efforts towards achieving our goals, even if I am not yet successful</td>
</tr>
<tr>
<td>13. My team leader acts in a kind way towards me</td>
</tr>
<tr>
<td>19. My team leader praises team members in a personal way for their contributions</td>
</tr>
<tr>
<td>21. My team leader provides me with personal mentoring to help me in my development</td>
</tr>
<tr>
<td>22. When our team is under pressure, my team leader gives us personal reassurance and support to keep us going</td>
</tr>
<tr>
<td>23. My team leader listens to my concerns with genuine interest</td>
</tr>
<tr>
<td>25. My team leader makes efforts to get to know me as a person, including my personal life (family, hobbies, interests, etc.)</td>
</tr>
<tr>
<td>28. My team leader shares openly about his/her true feelings related to our team’s work.</td>
</tr>
<tr>
<td>30. My team leader remembers team members’ birthdays, anniversaries, national celebration days, etc.</td>
</tr>
<tr>
<td>35. My team leader lets us know that he/she is interested in hearing about our concerns or worries related to either work-related or personal issues</td>
</tr>
</tbody>
</table>

Group Motivation Measure

The Group Motivation measurement score was obtained by measuring Commitment and Mental Effort (Ford, 1992; Clark, 1998; Enciso, 2000) using the questionnaire previously developed and tested by Enciso, 2000, based upon work by Clark (1998) and Ford (1992). The Motivational Systems Theory (MST) developed by Ford (1992) and further enhanced by Clark (1998) was an effort to create more readily applicable measures of motivation, combining the most commonly noted variables in the motivational equation for groups particularly, i.e. Commitment and Mental Effort (Pintrich & Schunk, 1996). Clark’s CANE Model (Commitment and Necessary Effort) extended the work done by Ford (1992) in his Motivational Systems Theory. This theory has been used successfully to develop the Group Motivation Questionaire (Encisco, 2000) used in the current study. This questionnaire was designed to assess Group-Motivation as opposed to individual motivation, and was tested with 101 software engineering teams (traditional, FTF teams in a major US organisation) who had been involved in project management to implement a
new software system. The Group Motivation Questionnaire was evaluated as being reliable enough for research purposes, with Cronbach’s coefficients ranging from .61 to .81 for all scales (Enciso, 2000, p. 77) which compares favorably with an correlation coefficient of .60, which has been suggested as an acceptable level of reliability for measurement tools used in basic research (Nunnally 1978, p. 226).

The Group Motivation Questionnaire operationalizes the CANE (1998) model of work motivation. It contains 39 questions assessing team members’ perceptions at group-level of analysis; values, emotion, agency (Commitment), and self-efficacy plus group efficacy (Mental Effort), described in Figure 3 below.

\[
\text{Commitment} = \text{Values} \times \text{Emotion} \times \text{Personal Agency} \\
+ \\
\text{Mental Effort} = \text{Self-Efficacy} + \text{Group Efficacy (Collaboration + Coordination)}
\]

\[
\text{Commitment} + \text{Mental Effort} = \text{Motivation}
\]

Figure 4 The Clark CANE Model of Motivation

Commitment-Related Questions:

Below are the questions related to the three components of Commitment: Values, Emotion and Agency. A Likert scale was used to capture respondent’s input, ranging from Strongly agree (5), Agree (4), Neutral (3), Disagree (2) and Strongly disagree (1). Reverse scored items are indicated by (R ).
Table 15 Commitment Items

<table>
<thead>
<tr>
<th>Value = the individual’s judgment as to whether their commitment will make them more effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>55. Our task appears to be interesting to many people on the virtual team.</td>
</tr>
<tr>
<td>77. I do not like the project work as much as I like the benefits I get from finishing the project. (R)</td>
</tr>
<tr>
<td>58. I like this virtual assignment because I’m good at this kind of job.</td>
</tr>
<tr>
<td>62. The time invested in this virtual task is a welcome break from the rest of my job.</td>
</tr>
<tr>
<td>76. While working on this virtual task, I expect to learn new skills from my teammates.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emotion = the individual’s desire to perform a task</th>
</tr>
</thead>
<tbody>
<tr>
<td>46. I think we are a very positive group of people.</td>
</tr>
<tr>
<td>50. Some people feel no sense of pride in their work. (R)</td>
</tr>
<tr>
<td>53. Some team members are angry because of past work experiences. (R)</td>
</tr>
<tr>
<td>63. I feel a sense of pride in the team’s work.</td>
</tr>
<tr>
<td>73. I think that my team-mates are happy about the team’s accomplishments.</td>
</tr>
<tr>
<td>80. Team members seem to be satisfied with the progress of the team.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agency = the individual’s feeling that he/she can perform the task and will be permitted to do it</th>
</tr>
</thead>
<tbody>
<tr>
<td>45. I believe the organisation will provide the necessary internal resources to make this virtual team succeed.</td>
</tr>
<tr>
<td>49. Team members believe they will be allowed to make the necessary decisions without management intervention.</td>
</tr>
<tr>
<td>51. The company’s culture will not allow our team to be successful. (R)</td>
</tr>
<tr>
<td>54. Management has provided the necessary consulting and technology resources in order for the team to be successful.</td>
</tr>
<tr>
<td>66. I believe this team’s virtual task is aligned with company objectives and will receive the support needed.</td>
</tr>
<tr>
<td>67. Decisions are not made fast enough because too much management approval is required. (R)</td>
</tr>
</tbody>
</table>

Individual scores were averaged for each question. The Commitment variable is multiplicative (Clark, 1998) thus the averaged scores for Value, Emotion and Agency were multiplied together to obtain a score for Commitment.

Mental Effort Measure

Mental effort comprises two elements: Self-Efficacy and Group Efficacy. Self-Efficacy is the individual’s perceived ability to get their job done and the set of questions reflects
fundamental principles of self-efficacy established by Bandura (1997) and the level of confidence experienced by each team member in their skills and capabilities to get their task done.

Table 16 Self-Efficacy Items

<table>
<thead>
<tr>
<th>Self-Efficacy Questions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>48. I have all the skills needed to perform my specific team role very well.</td>
</tr>
<tr>
<td>56. Most of my team-mates can do this job better than me. ( R )</td>
</tr>
<tr>
<td>60. My future in this company is limited because of my lack of job skills. ( R )</td>
</tr>
<tr>
<td>72. I am confident I can rapidly learn and use new technologies and tools needed to get my job done.</td>
</tr>
<tr>
<td>75. I have confidence in my ability to perform my role on the team.</td>
</tr>
<tr>
<td>78. When my performance is poor, it is due to my lack of ability for part of the job. ( R )</td>
</tr>
<tr>
<td>81. I am confident of my job skills and abilities.</td>
</tr>
</tbody>
</table>

Group Efficacy Measure

Group Efficacy is distinct from Self-Efficacy in that the frame of reference is the “group not the “individual”. The measure of Group Efficacy has two component parts: group collaboration and group coordination. Group efficacy is defined as the group’s aggregated perceived ability to work together to get their job done (Clark, 1998).

Table 17 Group Efficacy Items

<table>
<thead>
<tr>
<th>Collaboration Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>47. Responsibilities have been clearly delineated to each member.</td>
</tr>
<tr>
<td>61. Some members of the team do not contribute as much as they could. ( R )</td>
</tr>
<tr>
<td>64. There is a high level of cooperation on the team.</td>
</tr>
<tr>
<td>65. Team members seem to respect each other’s ability to work together.</td>
</tr>
<tr>
<td>70. It is important for our team to work together.</td>
</tr>
<tr>
<td>74. I think our team members are very skilled at planning and coordinating tasks.</td>
</tr>
<tr>
<td>79. The workload is fairly distributed among team members.</td>
</tr>
<tr>
<td>82. My virtual team works well together.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>52. My team members know their limitations and will ask for help before the problem gets out of control.</td>
</tr>
<tr>
<td>57. I can trust my team-mates to finish their own tasks on time.</td>
</tr>
<tr>
<td>59. Team members have different but necessary skills for their roles in this project.</td>
</tr>
<tr>
<td>68. Each team member was assigned to the virtual team because of his/her expertise in a specific area of the job.</td>
</tr>
<tr>
<td>69. All team members have excellent job skills.</td>
</tr>
<tr>
<td>71. I have confidence that my team-mates have the necessary skills for the job.</td>
</tr>
<tr>
<td>83. I feel I have the skill necessary to perform my role on the team.</td>
</tr>
</tbody>
</table>
Recent research into the best methodologies for assessing group efficacy in virtual teams, using graduate student groups as a test case, showed that it is more reliable to assess the individual team members’ perception of the group’s efficacy (as opposed to their own self-efficacy perceptions alone) and then aggregate scores for group-level analysis. This is also the method recommended by Bandura (1997). Other researchers agree that aggregated scores of individual members’ ratings of the group’s efficacy had greater predictability (Hardin, Fuller & Valacich, 2006). Thus, we aggregated the individual scores on the Group Motivation Questionnaire to obtain an average group-level score. These aggregated average scores provided input for Dependent Variable 1: Motivation.

**Cohesiveness Measure**

The Gross Cohesiveness Scale, (Gross, 1957) consisting of 7 questions related to purely social aspects (as opposed to task cohesion) of group cohesion was selected for its simplicity and reliability to measure cohesiveness and adapted for use in the virtual team setting. The GCS was the most widely used measure in research on group cohesion (Stokes, 1983). Gross (1957) built his measurement instrument around the “total field of forces model of group cohesion” (Festinger, Schachter, and Back, 1950, p. 164). The GCS was first applied in a 1957 study at Harvard University and was subsequently used in a variety of studies in university settings (Johnson & Fortman, 1988) and in therapy (Freedman, 1996) where it was shown to be reliable and valid in “assessing cognitive and affective aspects of cohesiveness.”(Johnson & Fortman, 1988). A further study was made using the Johnson & Fortman (1988) data to examine whether the Gross Cohesiveness Scale was a uni-dimensional (Gross, 1983b) or multi-dimensional measure, and found that the GCS is uni-dimensional, as well as reliable, with a coefficient of reproducibility of .90 (Cota, Dion and Evans, 1993, p.500). Scoring was done cumulatively, i.e. by adding the scores of each member of the group for each of the questions, to obtain a cumulative
cohesiveness score as done originally by Gross, (1957) and confirmed as the most appropriate method to score the GCS as it is “consistent with the empirical evidence” (Cota et al., 1993, p.505). As we are using the GCS with virtual teams as opposed to traditional face-to-face teams, it was necessary to add one question (as a supplement to the original question, “How often do you think your group should meet face-to-face?”): “How often do you think your group should meet virtually?” This was added following input from the pilot study participants, as mentioned earlier. A Likert scale was used, uniquely phrased for each question, as done originally by Gross (1957).

Table 18  Gross Cohesiveness Scale (adapted for use in virtual team setting)

<table>
<thead>
<tr>
<th>Cohesiveness Questions (Adapted from Gross Cohesiveness Scale, Gross, 1957).</th>
</tr>
</thead>
<tbody>
<tr>
<td>37. How many of your group members fit what you feel to be the idea of a good team member?</td>
</tr>
<tr>
<td>All of them (5); Most of them (4); Some of them (3); Only a few of them (2); None of them (1)</td>
</tr>
<tr>
<td>38. To what degree do you feel that you are included by the group in the group’s activities?</td>
</tr>
<tr>
<td>I am included in all the group’s activities (5); I am included in almost all of the group’s activities (4); I am included in some of the activities, but not in some others (3); I don’t feel that the group includes me in very many of its activities (2); I don’t feel that the group includes me in any of its activities (1).</td>
</tr>
<tr>
<td>39. How much do you like doing the activities in which you participate as a member of your group?</td>
</tr>
<tr>
<td>Like all of them very much (5); Like almost all of them (4); Like some of them, but not others (3); Like very few of them (2); Like none of them (1)</td>
</tr>
<tr>
<td>40. If most of the members of your group decided to dissolve the group by leaving, how hard would you try to persuade them to stay?</td>
</tr>
<tr>
<td>Would try very hard to persuade them to stay (5); Would try to persuade them to stay (4); Would make no difference to me if they stayed or left (3); Would not try to persuade them to stay (2); Would definitely not try to persuade them to stay (1).</td>
</tr>
<tr>
<td>41. If you were asked to participate in another project like this one, would you like to be with the same people who are in your present group?</td>
</tr>
<tr>
<td>Would want very much to be with the same people (5); Would rather be with the same people than with most others (4); Makes no difference to me (3); Would rather be with another group more than present group (2); Would want very much to be with another group (1).</td>
</tr>
<tr>
<td>42. How well do you like the group you are in?</td>
</tr>
<tr>
<td>Like it very much (5); Like it fairly well (4); Neutral (3); Don’t like it very much (2); Dislike it very much (1).</td>
</tr>
<tr>
<td>43. How often do you think your group should meet virtually?</td>
</tr>
<tr>
<td>Much more often than at present (5); More often than at present (4); No more often than at present (3); Less often than at present (2); Much less often than at present (1).</td>
</tr>
<tr>
<td>44. How often do you think your group should meet face-to-face?</td>
</tr>
<tr>
<td>Much more often than at present (5); More often than at present (4); No more often than at present (3); Less often than at present (2); Much less often than at present (1).</td>
</tr>
</tbody>
</table>
**Group Effectiveness Measure**

In thirteen studies of project team (traditional FTF teams) studies reviewed by Cohen & Bailey (1997), the most frequently used measure of project team effectiveness was external perceptions held by managers or supervisors. Managers were most often asked to rate a project team along five measures of performance: (1) how well it met budgetary constraints, (2) how well it met schedules and deadlines; (3) how well it produced innovative results; (4) the quality of the project, and (5) overall performance or efficiency. (Cohen & Bailey, 1997, p. 260). Advances in the cross-cultural measurement of team effectiveness were made by Gibson et al. (2003), who created a list of criteria which apply across cultural contexts to gauge whether a team can be called “effective”, incorporating findings from earlier research discussed above. Gibson et al. (2003) contend that the effective team: “(a) meets its objectives, goals, purpose; (b) satisfies the needs of its customers (internal/external); (c) meets its deadlines and schedules; (d) delivers high quality work; (e) works efficiently (Gibson et al. 2003). This measurement scale is useful for the purposes of the current study as it bridges the gaps created by different cultural contexts, a condition that is inherent in the global virtual team setting (Gibson et al. 2003). Gibson et al. (2003) found that the GEM scales reliability scores for each of the sub-sets were in the ranges acceptable for new scales (Nunnally, 1978, p. 226): For each sub-scale, reliability coefficients were as follows: Goals sub-set (C=.72-.92); the Customer Satisfaction sub-set (C=.81-.96); the Timeliness sub-set (C=.62-.88); the Quality sub-set (C=.62-.88); and the Productivity sub-set (C=.46-.81). Average scores were obtained across each sub-dimension (Goals, Customer Satisfaction, Timeliness, Quality and Productivity) and then these 5 average scores were then averaged to obtain a total Group Effectiveness score for each team, as recommended by the original research on the scale (Gibson et al., 2003; Gibson, 2009). This measure of Group Effectiveness (GEM), was
obtained by giving a separate survey to the Sponsor or Manager of each of the virtual teams surveyed, containing objective measures of team effectiveness, as previously developed by Gibson et al. (2003) in a study of multinational teams. A Likert scale was employed, with responses ranging along the scale 1-6 according to the sponsor’s agreement with each item. The Group Effectiveness Questionnaire items are shown in the table below, where (R) indicates reverse coded items.

**Table 19 Group Effectiveness Questionnaire**:

<table>
<thead>
<tr>
<th>Goals:</th>
<th>Customers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- This team fulfills its mission.</td>
<td>- This team’s customers are satisfied.</td>
</tr>
<tr>
<td>- This team accomplishes its objectives</td>
<td>- The team’s customers are happy with the team’s performance.</td>
</tr>
<tr>
<td>- The team meets the requirements set for it.</td>
<td>- This team is responsive to its customers.</td>
</tr>
<tr>
<td>- This team achieves its goals.</td>
<td>- This team fulfills the needs of its customers.</td>
</tr>
<tr>
<td>- This team serves the purpose it is intended to serve.</td>
<td>- This team responds to external demands.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timeliness:</th>
<th>Quality:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- This team meets its deadlines.</td>
<td>- This team has a low error rate.</td>
</tr>
<tr>
<td>- This team wastes time. (R)</td>
<td>- This team does high quality work.</td>
</tr>
<tr>
<td>- This team provides deliverables (e.g. products or services) on time.</td>
<td>- This team consistently provides high quality output.</td>
</tr>
<tr>
<td>- This team is slow. (R)</td>
<td>- This team is consistently error free.</td>
</tr>
<tr>
<td>- This team adheres to its schedule.</td>
<td>- This team needs to improve the quality of its work. (R)</td>
</tr>
<tr>
<td>- This team finishes its work in a reasonable amount of time.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Productivity:</th>
<th>Response Scale:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- This team uses too many resources. (R)</td>
<td>Very Accurate (6)</td>
</tr>
<tr>
<td>- This team is productive.</td>
<td>Slightly Accurate (5)</td>
</tr>
<tr>
<td>- This team is wasteful. (R)</td>
<td>Uncertain (4)</td>
</tr>
<tr>
<td>- Inputs used by this team are appropriate for the outputs achieved.</td>
<td>Slightly Inaccurate (3)</td>
</tr>
<tr>
<td>- This team is efficient.</td>
<td>Mostly Inaccurate (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Productivity:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- This team uses too many resources. (R)</td>
<td>Very Inaccurate (1)</td>
</tr>
<tr>
<td>- This team is productive.</td>
<td></td>
</tr>
<tr>
<td>- This team is wasteful. (R)</td>
<td></td>
</tr>
<tr>
<td>- Inputs used by this team are appropriate for the outputs achieved.</td>
<td></td>
</tr>
<tr>
<td>- This team is efficient.</td>
<td></td>
</tr>
</tbody>
</table>
4.3 On-line Survey Design

The survey instrument was designed in conformance with recommendations for team leadership and performance assessment surveys instruments proposed by other researchers, including these requirements:

- The survey questions should be realistic, relevant and be immediately recognizable to survey respondents;
- The questions must reflect real-life experience of virtual team members;
- The questions must be generic enough to apply to a wide range of industries;
- The survey should not be too long, to keep the response time to under 20 minutes;
- The survey should be internet-friendly, as it would be administered using an internet survey site (Savasubramaniam, Murry, Avolio & Jung, 2002)

Based upon these recommendations, the final 84-question team member survey was designed to take approximately 20 minutes to complete. It consisted of four parts:

I: **Demographic Information** (5 items; Contact Information, Gender, Age, Education Level, Years with Company)

II: **Perceived Leader Behaviours** (31 items: 30 items as reviewed and approved by expert panel plus one additional open-response item included to solicit additional commentaries for the leader feedback phase)

III: **Team Perceived Cohesiveness** (8 items; adapted from Gross Cohesiveness Scale.)

IV: **Team Perceived Motivation** (40 items: 39 items from adapted Group Motivation Questionnaire, (Enciso, 2000) plus one open-response item included to solicit additional commentaries for the leader feedback phase.)

4.4 Perceived Leader Behaviours Questionnaire Reliability Test

In the previous section, we discussed the reliability of the Cohesiveness questions in Part 2 of the survey (Gross, 1957), the Motivation questionnaire (Enciso, 2000) and the Group Effectiveness Measure (Gibson et al., 2003). However, Part I consisted of newly-created questions, and thus it was judged necessary to test this section of the survey for reliability.
This was done by administering the 30 questions Perceived Leader Behaviours (PLB) questionnaire to 107 MBA students at the China Europe International Business School, as a part of their Quantitative Methods coursework, (non-graded). These MBA students have on average 8 years of working experience and average age of 32 years, therefore match quite well the expected sample demographics intended for this study. The results showed Cronbach’s Alpha for each sub-set of questions as follows: Inclusion ($\alpha=.912$), Control ($\alpha=.831$) and Affection ($\alpha=.879$) and the overall questionnaire combining all three sets of questions shows coefficient alpha of ($\alpha=.919$). Although a coefficient alpha above .90 “may point to redundancy among the items” (Streiner, 2003, p. 103), it is expected to see some redundancy in the complete set of questions, as there is some overlap among the scales for Inclusion and Affection, (Macrosson, 2000; Siegel et al. 2001). See Appendix 1 for results of the reliability test.

4.5 Sample Characteristics

As we have seen earlier in the review of the literature, there are very few studies as of this time that have been able to study perceived leadership behaviours with the input of actual corporate virtual team members; there are more numerous studies that have been done using student groups, given the convenience of having large numbers of willing participants. In this researcher’s case, the objective was to gather a representative sample of virtual teams by enrolling Human Resource directors known to the researcher and to recruit a large enough number of real virtual team leaders in the project.

Several companies were approached for participation in the study, working through the Human Resources Departments to obtain permission, to explain the terms of
confidentiality and names of candidate virtual team leaders whose teams met the criteria of participation. These criteria were strictly adhered to in selecting the participating teams:

- The team must be working mostly virtually, i.e. working day-to-day using telecommunications and meeting face-to-face no more than 6 times per year.
- The team should have between 4 and 14 members.
- The team must have a designated team leader.
- The team should have a shared objective; i.e. all members work toward the same objective.
- The team should have worked together as a complete unit no more than four years i.e. formed after January 2005.

A naturally occurring set of virtual teams were enrolled as a follow-up to these team leaders’ participation in an in-company leadership development program, within one large European-based global manufacturing company in the construction equipment industry, as they were personally known to the researcher and already familiar with the FIRO framework. Another set of virtual teams were identified within the Danish Trade Council (DTC) in China, due to a previous contact with the head of this organisation. The DTC teams work across China and Denmark on marketing and promotion of Danish industrial products and services, work fully virtually, and work in similar ways to the other industrial teams in the study and met all the criteria for participation. In addition, a number of virtual team leaders were enrolled from a large, global multinational corporation active in the pan-Asian Healthcare and Energy sectors. Another set of teams was invited to participate from a global maritime equipment manufacturer; however participation was quite limited and only one small team volunteered to take part.

**Sample Size:**

Field (2005) provides some guidelines for the desired sample size in light of the probability level typically sought in psychological or social science research (\( \alpha = .05 \)) and the statistical power of our test (.8), and the number of variables. Based on this
recommendation, we would need 85 responses to detect medium effect size (r=.3) and 783 responses to detect small effect size (r=.1). Based upon the limited number of variables involved in this study, a suitable sample size was determined to be approximately 200 participant responses. Thus, it was considering highly satisfactory to conclude the study with 221 useable responses from team members. The break-down of participating team leaders and number of team members in each of the companies / business organisations involved were:

Table 20 Participating Organisations

<table>
<thead>
<tr>
<th>Company/Organisation Identification</th>
<th># teams</th>
<th># team members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Construction Equipment Manufacturer</td>
<td>18</td>
<td>143</td>
</tr>
<tr>
<td>Global Energy &amp; Health Equipment Manufacturer</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>Danish Trade Council Business Marketing Teams</td>
<td>6</td>
<td>27</td>
</tr>
<tr>
<td>Global Maritime Equipment Manufacturer</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
<td><strong>221</strong></td>
</tr>
</tbody>
</table>

4.6 Ethical Considerations

Given that the research involved direct feedback about each leader’s behaviours, it was important to provide assurance to each participating team leader that the gathered data would be exclusively the property of the researcher and the participating leader him/herself, and was not to be reviewed by Human Resources, the participant’s supervisor or any other external party. A Statement of Confidentiality (Appendix 5) was signed by each participating Human Resources Director or equivalent, and a copy was provided to all participating leaders and team members. The identity of the participating team members was recorded on the on-line surveys for purposes of identifying who had or had not yet completed the survey; however these identities were erased from the database after
each team’s members had completed the survey. When feedback was provided to the team leaders, the identities of the team members were not given, thus preserving the anonymity condition promised to participants and leaders. This was to encourage complete candidness from all persons completing the survey. In addition, the Team Effectiveness Survey, which was completed by 31 team sponsors, was not reviewed at all with the participating team leaders. It was merely used to provide an objective rating of effectiveness of each team, to provide the third dependent variable (team effectiveness) for purposes of the study.

The survey data were collected online using a professional on-line data collection service, Survey Monkey, and was encrypted using 128-bit SSL (Secure Socket Layer) technology, commonly used to protect data transmitted over the Internet. Survey data were available to this researcher using a password and user name. Following completion of each team’s surveys, the data were downloaded from Survey Monkey to the researcher’s personal computer and back-up hard drive. Survey data will be held for one year in electronic form following the publication of the researcher’s dissertation, and then will be destroyed.

4.7 Pilot Test

Three virtual team leaders were enlisted to take part in the pilot study. All three team leaders had been leading virtual teams for over 5 years and have a great deal of experience in virtual working. One team was found inside a major US-based global chemical MNC, one team was within the Swedish Trade Council working globally across 3 continents to direct trade promotion activities for Swedish firms and government; and one team was within a major automotive manufacturing company based in France. Each pilot test incorporated tests of the two major survey instruments, the “team member survey” (82
items including 6 demographic data related questions) and the “team effectiveness survey” (25 items, from Gibson et al. 2003). As a result of the pilot tests, a number of adjustments were made to the Team Member questionnaire:

- A new item was added to the cohesiveness set of questions in part 2 of the questionnaire; i.e. “how often do you think your team should meet virtually?” was added as a follow-up to the original question, “how often do you think your team should meet face-to-face?”

- Wording of the questions was changed to eliminate “this virtual project” from many of the questions in part 3, the Group Motivation Questionnaire section. The rationale for this change is found in the fact that the Enciso (2000) Group Motivation questionnaire was originally designed to be used with SAP-Project Teams. In the current study, this questionnaire would need to be applicable universally to many different types of virtual teams, thus it was concluded that eliminating the “project” aspect would make the questions more relevant and realistic.

- The language of some questions was further simplified to avoid misunderstanding by non-native English speakers.

- A final open-ended question was added to collect additional team member comments on additional improvements that might be made in the team’s working practices.

4.8 Data Collection Procedures

Each virtual team leader who was identified as a candidate for the study was contacted by telephone and briefed on the purpose and process of taking part in the study, and provided the Invitation to Participate (Appendix 4) and the Statement of Confidentiality (Appendix
5). Following this initial contact, an 84-item electronic survey was distributed to the approved virtual team leaders, who then distributed the web-links for the electronic survey to their team members by email, adding a brief introduction with a standard text provided by the researcher (Appendix 6). Responses were collected via the business information survey tool “Survey Monkey” (www.surveymonkey.com) and tabulated. A separate electronic survey (Group Effectiveness Survey, or GEM) was sent to each virtual team’s supervisor, containing 25 questions regarding the effectiveness of the team. Following collection of all the team members’ responses to the Team Member Survey, as well as the collection of the team supervisor’s survey, the researcher summarized the findings in a 17 page Powerpoint document, which was sent by email to each virtual team leader, followed by a one-hour long coaching and feedback discussion by telephone, to help the participating leader understand the findings and formulate a plan of action to address short-comings.

The data collection began in March 2008 and ended April, 2009. The economic crisis of late autumn 2008 created delays and cancellations in many candidate teams’ planned participation. However, additional teams were identified in March, 2009, supplementing the earlier participating firms’ data. An initial sample of 237 team members working within 31 operational virtual teams within 4 business organisations in 3 industries took part in the study. However, due to problems in collecting a the complete set of data from 2 teams, these were omitted from the final set of data, leaving a viable total sample of 221 virtual team members, with group effectiveness survey data collected from 31 team sponsors/managers/supervisors.

4.9 Sample Demographics

The 31 team leaders included in the study had been pre-screened by the researcher by telephone to ascertain whether each candidate team met the criteria for participation. Not
surprisingly, 80% of team leaders were male, which appears to be a typical feature of industrial companies operating in heavy equipment manufacturing. These teams were highly diverse geographically, i.e. 55% of the teams had team members in 3 or more national locations and these teams had members situated across 22 different country locations, including Vietnam, Korea, Singapore, China, India, Malaysia, Thailand, Indonesia, Australia, Japan, Russia, Sweden, Denmark, Poland, France, Italy, Germany, UK, USA, Canada, South Africa and Brazil. The team leaders’ office locations were situated as follows:

**Table 21: Physical Location of Team Leaders**

<table>
<thead>
<tr>
<th>Region</th>
<th># of team leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia (China=8)</td>
<td>13</td>
</tr>
<tr>
<td>Western Europe</td>
<td>11</td>
</tr>
<tr>
<td>North America</td>
<td>5</td>
</tr>
<tr>
<td>Australia</td>
<td>1</td>
</tr>
<tr>
<td>South America</td>
<td>1</td>
</tr>
</tbody>
</table>

The 31 teams had a variety of functions as seen in figure 4 below.
The teams were highly virtual in that 97% of the teams met face-to-face less than four times (quarterly) annually, as seen in Figure 5 below. The average time-span difference between time zones experienced by team members was 6.3 hours. In this sense, the sample was ideal in representing a cross-section of operating virtual teams in a variety of industries globally, thus providing a close parallel representation of the conditions faced by most global virtual teams.

![Graph showing the number of face-to-face meetings annually](image)

**Figure 6: Number of Face-to-Face Meetings Annually for Each Team n=31 teams**

**Participating Team Members: Demographics**

The total number of team members providing responses to the team member survey was 221 participants, of whom 79% were male; 89% age 31 or older and 83% possessed bachelor’s degrees or higher levels of education. These team member characteristics mirror the professional workforce profile of many industrial-equipment manufacturers and distributors using virtual teams today.
Figure 7: Gender of Participating Team Members n= 221

Figure 8: Age of Participating Team Members n=221
Figure 9: Highest level of education attained, participating team members n=221
5.1 Descriptive Statistics

Before beginning to run the correlations, it was necessary to explore the data set to determine normality, so as to confirm whether parametric or non-parametric correlation techniques would be most appropriate. Using the SPSS Version 15.0 EXPLORE function, we ran the data descriptive statistics, to obtain frequency distributions for all of the variables.

Table 22: Distributions, means and standard deviations for all variables

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion</td>
<td>221</td>
<td>1,7</td>
<td>5,0</td>
<td>3,996</td>
<td>,6384</td>
</tr>
<tr>
<td>Control</td>
<td>221</td>
<td>1,7</td>
<td>5,0</td>
<td>3,533</td>
<td>,6126</td>
</tr>
<tr>
<td>Support</td>
<td>221</td>
<td>1,5</td>
<td>5,0</td>
<td>3,581</td>
<td>,6957</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>221</td>
<td>21,0</td>
<td>40,0</td>
<td>30,54</td>
<td>3,6199</td>
</tr>
<tr>
<td>Motivation</td>
<td>221</td>
<td>24,6</td>
<td>116,1</td>
<td>60,15</td>
<td>16,0339</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>221</td>
<td>3,3</td>
<td>6,0</td>
<td>4,944</td>
<td>,7208</td>
</tr>
</tbody>
</table>

A visual scan of the frequency distributions for Inclusion, Control, Affection, Cohesiveness, and Motivation data sets indicated a normal distribution but with varying degrees of apparent skewness and kurtosis, seen in Table 23 below, and in frequency distribution histograms shown in Figure 11, Appendix 9. The Q-Q plot of each of the 6 variables of interest was also generated (see Appendix 9) where a normal expected distribution was compared to the observed values. Here we see deviation from the normal distribution, especially for effectiveness.
Table 23: Descriptive statistics; skewness, kurtosis

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Inclusion</th>
<th>Control</th>
<th>Support</th>
<th>Motivation</th>
<th>Cohesiveness</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (Valid)</td>
<td>221</td>
<td>221</td>
<td>221</td>
<td>221</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>N (Missing)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>3,996</td>
<td>3,533</td>
<td>3,581</td>
<td>60,158</td>
<td>3,839</td>
<td>4,944</td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>.0429</td>
<td>.0412</td>
<td>.0468</td>
<td>1,0786</td>
<td>.0299</td>
<td>.0485</td>
</tr>
<tr>
<td>Median</td>
<td>4,000</td>
<td>3,500</td>
<td>3,600</td>
<td>59,200</td>
<td>3,900</td>
<td>5,100</td>
</tr>
<tr>
<td>Mode</td>
<td>4.0</td>
<td>3.3</td>
<td>3.8</td>
<td>53.4</td>
<td>3.9</td>
<td>5.2</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.6384</td>
<td>.6126</td>
<td>.6957</td>
<td>16,0339</td>
<td>.4448</td>
<td>.7208</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.810</td>
<td>-.142</td>
<td>-.370</td>
<td>.552</td>
<td>.107</td>
<td>-.961</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.164</td>
<td>.164</td>
<td>.164</td>
<td>.164</td>
<td>.164</td>
<td>.164</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>.861</td>
<td>.311</td>
<td>-.035</td>
<td>.845</td>
<td>-.189</td>
<td>.268</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.326</td>
<td>.326</td>
<td>.326</td>
<td>.326</td>
<td>.326</td>
<td>.326</td>
</tr>
</tbody>
</table>

The Effectiveness data frequency distribution seems to be particularly non-parametric; thus we ran the Kolmogorov-Smirnov and Shapiro-Wilk tests of normalcy recommended to test for normal distribution, looking for a p value > .05 (Field, 2005) to indicate normal distribution. The results of this test are seen in Table 24 below; in Appendix 9 you will find the group-wise analysis looking at the 4 companies’ scores for this test.

Table 24: Tests of Normality in Data Sets

<table>
<thead>
<tr>
<th>Tests of Normality</th>
<th>Kolmogorov-Smirnov(a)</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic c</td>
<td>df</td>
</tr>
<tr>
<td>Inclusion</td>
<td>.103</td>
<td>221</td>
</tr>
<tr>
<td>Support</td>
<td>.071</td>
<td>221</td>
</tr>
<tr>
<td>Control</td>
<td>.067</td>
<td>221</td>
</tr>
<tr>
<td>Cohesiveness</td>
<td>.088</td>
<td>221</td>
</tr>
<tr>
<td>Motivation</td>
<td>.053</td>
<td>221</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>.219</td>
<td>221</td>
</tr>
</tbody>
</table>

* This is a lower bound of the true significance.
A Lilliefors Significance Correction

From this test we can see that the significance is lower than 0.05 for Inclusion, Support, Motivation and Effectiveness. The Shapiro-Wilk test is the more accurate of the two tests.
according to Field (2005) and thus, looking only at the S-W analysis, we may conclude that the only variables showing a normal distribution are Control and Cohesiveness.

A second assumption of parametric tests that needed to be analysed was the homogeneity of variance, as the data were collected from four different organisations with widely varying sample sizes (Field, 2005), thus Levene’s test was run on the data set to see if the variances in the groups are equal (it should be equal to zero) (Field, 2005). It is clear that there are large variations in the variances between the four groups for Motivation and Effectiveness, where significance values were ≤ .05 for group variances for these two variables. Figure 12 in Appendix 9 shows the result of the Levene’s test of homogeneity of variances. Figures 13-17 in Appendix 9 show Q-Q plots of normality for a sample of the company-based groupings of data. Thus, we conclude that for the purposes of the bivariate analysis of relationships between the Independent Variables and Dependent Variables it would be safe to assume that the data are non-parametric and run tests accordingly.

5.2 Data Analysis Procedures

The current study can be characterized as a correlational research study using quantitative survey data collected from virtual team members and virtual team sponsors. In light of the bivariate correlational analysis intended to measure relationships between the variables showing parametric distribution (Control and Cohesiveness) in correlation against the other variables showing non-parametric distributions, it would be most conservative to apply exclusively the correlation techniques recommended for non-parametric data, Spearman’s correlation (Field, 2005) for the purpose of testing hypotheses related to correlations between the 3 individual independent variables (Expressed Inclusion, x^1,
Expressed Control, \( x^2 \) and Expressed Affection, \( x^3 \) and each of the dependent variables (Group Motivation, \( y^1 \); Group Effectiveness, \( y^2 \); and Group Cohesiveness, \( y^3 \)), and combined leadership behaviours, i.e. Inclusion + Control + Affection (\( x^1+x^2+x^3 \)) with the dependent variables. One-tailed testing will indicate directionality in the effects (Field, 2005). In addition, we will examine whether there are correlations between one or more of the dependent variables, ex. Does Group Motivation correlate with Group Cohesiveness and Effectiveness; Does Group Cohesiveness correlate with group Motivation and Effectiveness? Below is the model describing the Data Analysis Procedures.

Collected data were first downloaded from the SurveyMonkey website into Excel spreadsheets, and translated into numeric, interval data using Excel-Pipe software. Reversed scored items on the Team Member Survey and Group Effectiveness instruments were corrected and inputted along the normal scale of measurement. Then, the data were sorted into categories pertaining to each of the independent and dependent variables. Average scores were taken for each respondent’s scores for Inclusion, Control and
Affection and recorded in the data entry for SPSS for each variable. The use of averaged scores facilitates the analysis of the data and has been suggested by some authors as increasing the reliability of measures (Nunnally & Bernstein, 1994). Computations of the Motivation Score were obtained by multiplying averaged scores for Value, Emotion and Agency, as indicated by the Clark CANE model; this product was added to the sum of Mental Effort components (Self-Effectiveness + Group Effectiveness) to obtain the total Motivation score for each respondent. The Cohesiveness scores were obtained by adding up the individual scores for each of the eight items, as suggested by Gross (1957) to obtain a cumulative score. The Effectiveness scores were obtained by averaging the scores for each of the 5 sub-groupings in the questionnaire, and then averaging these five averages to obtain a total average score (Gibson, 2009). The team sponsor’s score for Effectiveness was assigned to each of the data cases for the members of the respective team, thus Team Leader 1 would get a score of 3.8 and all members of team one would show an entry of 3.8 in the effectiveness score column, as illustrated in Figure 19 in Appendix 9. The columns of data for each variable were then loaded into SPSS Data Editor, version 15.0. Descriptive statistics were used to check the data for frequencies and distribution normality. There seems to be some degree of linearity of the relationship between Leadership Combined Behaviours and the 2 of the 3 Dependent Variables shown in the scatterplots shown below in Figure 10 with the exception of Effectiveness.
Thus correlation analysis was selected to test the strength of the relationships between the Independent and Dependent variables. Inferential statistical graphing was used to discover all correlations among variables, specifically Spearman’s rho correlation testing was applied, as it is recommended for data that does not conform to normal distribution.

![Figure 1](image1.png)  
**Figure 11: Scatterplots of Combined Leadership (PeI, PeC, PeA) and Dependent Variables**

Each hypothesis was tested applying Spearman’s bivariate correlation, one-tailed test, since there is directionality under consideration in each hypothesis (Field, 2005), using SPSS CORRELATE. Results were interpreted against the expected significance values and the Null Hypothesis was determined to be supported or rejected on this basis.
Chapter Six

FINDINGS

6.1 Research Question One: VT leadership behaviours relationship to group effectiveness

The first research question (What relationship does a virtual team leader’s perceived behaviours in Inclusion, Control and Affection have on Group Effectiveness?) contains 3 sub-hypotheses which will be stated in both the alternate and null forms and tested using Spearman’s correlation test, with a one-tailed test given that directionality is of interest in all the stated hypotheses.

\[ H_A1: \] The perceived Inclusion (PeI) behaviours of the VTL are positively related to group effectiveness.

\[ H_01: \] The perceived Inclusion (PeI) behaviours of the VTL are not positively related to the team’s effectiveness.

Table 25: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Inclusion and Effectiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Inclusion</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion</td>
<td>1.000</td>
<td>.145(*)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.015</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.996</td>
<td>4.944</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6384</td>
<td>.728</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (1-tailed).

We may reject the null hypothesis for H1.

\[ H_A2: \] The perceived Control (PeC) behaviours of the VTL are positively related to group effectiveness.

\[ H_02: \] The perceived Control (PeC) behaviours of the VTL are not positively related to the team’s effectiveness
Table 26: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Control and Effectiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.000</td>
<td>.111</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.050</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.533</td>
<td>4.944</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6126</td>
<td>.728</td>
</tr>
</tbody>
</table>

We may accept the null hypothesis for H2.

$H_A^3$: The perceived Affection (PeA) behaviours of the VTL are positively related to group effectiveness.

$H_0^3$: The perceived Affection (PeA) behaviours of the VTL are not positively related to the team’s effectiveness.

Table 27: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Affection and Effectiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Affection</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affection</td>
<td>1.000</td>
<td>.143(*)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.017</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.581</td>
<td>4.944</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6957</td>
<td>.728</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (1-tailed).

We may reject the null hypothesis for H3.

$H_A^4$: The combined level of expressed behaviour of the VTL (Inclusion + Control + Affection) are positively related to group effectiveness.

$H_0^4$: The combined level of expressed behaviour of the VTL (Inclusion + Control + Affection) are not positively related to the team’s effectiveness.
Table 28: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Inclusion, Control and Affection Combined and Effectiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Combined ICA</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined ICA</td>
<td>1.000</td>
<td>.139(*)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.020</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>11.11</td>
<td>4.944</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.7598</td>
<td>.728</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (1-tailed).

We may reject the null hypothesis for H4.

6.2 Research Question Two: VT leadership behaviours relationship with team motivation

The second research question (What relationship does a virtual team leader’s (VTL) behaviours, as perceived by members of the virtual team, in Inclusion, Control and Support, have on the team’s perceived Motivation?) contains 3 sub-hypotheses which will be stated in both the alternate and null forms and tested using Spearman’s correlation test, with a one-tailed test given that directionality is of interest in all the stated hypotheses.

H₅: The perceived Inclusion (PeI) behaviours of the VTL are positively related to perception of group motivation.

H₀: The perceived Inclusion (PeI) behaviours of the VTL are not positively related to perception of group motivation.
Table 29: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Inclusion and Motivation Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Inclusion</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion</td>
<td>1.000</td>
<td>.431(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.996</td>
<td>60.156</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6384</td>
<td>16.0339</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

We may reject the null hypothesis for H5.

H\textsubscript{A6}: The perceived Control (PeC) behaviours of the VTL are positively related to perception of group motivation

H\textsubscript{0}6: The perceived Control (PeC) behaviours of the VTL are not positively related to perception of group motivation.

Table 30: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Control and Motivation Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.000</td>
<td>.329(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.533</td>
<td>60.156</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6126</td>
<td>16.0339</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

Thus, we may reject the Null Hypothesis for H6.

H\textsubscript{A7}: The perceived Affection (PeA) behaviours of the VTL are positively related to perception of group motivation.

H\textsubscript{0}7: The perceived Affection (PeA) behaviours of the VTL are not positively related to perception of group motivation.
Table 31: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Affection and Motivation Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Affection</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affection</td>
<td>1.000</td>
<td>.453(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.581</td>
<td>60.156</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6957</td>
<td>16.0339</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

We may reject the Null Hypothesis for H7.

Hₐ8: The combined level of expressed behaviour of the VTL (Inclusion + Control + Affection) are positively related to group motivation.

H₀8: The combined level of expressed behaviour of the VTL (Inclusion + Control + Affection) are not positively related to the group motivation.

Table 32: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Inclusion, Control and Affection Combined and Motivation Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Combined ICA</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined ICA</td>
<td>1.000</td>
<td>.460(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.0</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>11.11</td>
<td>60.156</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.7598</td>
<td>16.0339</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

We may reject the Null Hypothesis for H8.

6.3 Research Question Three: VT Leadership behaviour relationship to team cohesiveness

The third research question (What relationship does a virtual team leader’s (VTL) behaviours, as perceived by members of the virtual team, in Inclusion, Control and
Support, have on the team’s perceived Cohesiveness?) contains 3 sub-hypotheses which will be stated in both the alternate and null forms and tested using Spearman’s correlation test, with a one-tailed test given that directionality is of interest in all the stated hypotheses.

**Hₐ₉:** The perceived Inclusion (PeI) behaviours of the VTL are positively related to perceived group cohesiveness.

**H₀₉:** The perceived Inclusion (PeI) behaviours of the VTL are not positively related to perception of group cohesiveness.

Table 33: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Inclusion and Cohesiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Inclusion</th>
<th>Cohesiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion</td>
<td>1.000</td>
<td>.426(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.996</td>
<td>30.543</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6384</td>
<td>3.61</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

We may reject the Null Hypothesis for H₉.

**Hₐ₁₀:** The perceived Control (PeC) behaviour of the VTL are positively related to perceived group cohesiveness.

**H₀₁₀:** The perceived Control (PeC) behaviours of the VTL are not positively related to perception of group cohesiveness.
Table 34: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Control and Cohesiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Cohesiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>1.000</td>
<td>.323(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.533</td>
<td>30.543</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6126</td>
<td>3.61</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

Thus, we may reject the Null Hypothesis for H10.

**H_A11**: The perceived Affection (PeA) behaviours of the VTL are positively related to perceived group cohesiveness.

**H_011**: The perceived Affection (PeA) behaviours of the VTL are not positively related to perception of group cohesiveness

Table 35: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Affection and Cohesiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Affection</th>
<th>Cohesiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affection</td>
<td>1.000</td>
<td>.476(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>3.581</td>
<td>30.543</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>.6957</td>
<td>3.61</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

Thus we may reject the Null Hypothesis for H11.

**H_A12**: The combined level of expressed behaviour of the VTL (Inclusion + Control + Affection) are positively related to group cohesiveness.

**H_012**: The combined level of expressed behaviour of the VTL (Inclusion + Control + Affection) are not positively related to the group cohesiveness.
Table 36: Spearman’s Correlations, means and standard deviations for VT Leader Expressed Inclusion, Control and Affection Combined and Cohesiveness Dependent Variable (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Combined ICA</th>
<th>Cohesiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined ICA</td>
<td>1.000</td>
<td>.453(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>221</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>11.11</td>
<td>30.543</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.7598</td>
<td>3.61</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

We can reject the Null Hypothesis for H12.

6.4 Research Question Four: VT Motivation relationship with effectiveness

Testing for research question 4 (Is a Virtual Team’s level of Group Motivation related to its Effectiveness?) proceeds in similar fashion:

**H_{A13}:** The virtual team’s level of motivation is positively related to the group’s effectiveness.

**H_{013}:** The virtual team’s level of motivation is not positively related to the group’s effectiveness.

Table 37: Spearman’s Correlations, means and standard deviations for Motivation and Effectiveness (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Motivation</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>1.000</td>
<td>.068</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.156</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>60.156</td>
<td>4.944</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>16.0339</td>
<td>.728</td>
</tr>
</tbody>
</table>
We may accept the Null Hypothesis for H13.

6.5 Research Question Five: VT cohesiveness relationship with effectiveness

Testing of the fifth research question (Is a Virtual Team’s level of Cohesiveness related to its level of Effectiveness?) proceeds similarly:

$H_{A14}$: The virtual team’s level of cohesiveness is positively related to the group’s effectiveness.
$H_{014}$: The virtual team’s level of cohesiveness is not positively related to the group’s effectiveness.

Table 38: Spearman’s Correlations, means and standard deviations for Cohesiveness and Effectiveness (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cohesiveness</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohesiveness</td>
<td>1.000</td>
<td>.060</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.186</td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>30.543</td>
<td>4.944</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>3.61</td>
<td>.728</td>
</tr>
</tbody>
</table>

Thus, we can accept the Null Hypothesis for H14.

6.6 Research Question Six: Relationship between VT Cohesiveness and Motivation

Testing of the sixth research question (Is a Virtual Team’s level of Cohesiveness related to its level of Group Motivation?) proceeds similarly:

$H_{A15}$: The virtual team’s level of cohesiveness is positively related to the group’s perceived motivation.
$H_{015}$: The virtual team's level of cohesiveness is not positively related to the group’s perceived motivation.
Table 39: Spearman’s Correlations, means and standard deviations for Cohesiveness and Motivation (N=221)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cohesiveness</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohesiveness</td>
<td>1.000</td>
<td>.525(**)</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>221</td>
<td>221</td>
</tr>
<tr>
<td>Mean</td>
<td>30.543</td>
<td>60.156</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>3.61</td>
<td>16.0339</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed).

Thus, we may reject the Null Hypothesis for H15.

Table 40: Summary of Spearman’s rho correlations, Means and SD, for H1-H12

<table>
<thead>
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<th>Cohesiveness</th>
<th>MEAN</th>
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<tr>
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<td>.431**</td>
<td>.426**</td>
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<tr>
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<tr>
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<td>.453**</td>
<td>.476**</td>
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<tr>
<td>Combined I,C,A</td>
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<td>.460**</td>
<td>.453**</td>
<td>11.11</td>
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</tr>
</tbody>
</table>

* = correlation significant at 0.05 level, 1-tailed test  
** = correlation significant at 0.01 level, 1-tailed test
In conclusion:

Hypotheses Supported

\( H_A1 \): The perceived Inclusion (PeI) behaviours of the VTL are positively related to group effectiveness. (.145*)

\( H_A3 \): The perceived Affection (PeA) behaviours of the VTL are positively related to group effectiveness. (.143*)

\( H_A4 \): The combined level of expressed behaviour of the VTL (Inclusion + Control + Support) are positively related to group effectiveness. (.139*)

\( H_A5 \): The perceived Inclusion (PeI) behaviours of the VTL are positively related to perception of group motivation. (.431**) 

\( H_A6 \): The perceived Control (PeC) behaviours of the VTL are positively related to perception of group motivation. (.329**) 

\( H_A7 \): The perceived Affection (PeA) behaviours of the VTL are positively related to perception of group motivation. (.453**) 

\( H_A8 \): The combined level of expressed behaviour of the VTL (Inclusion + Control + Support) are positively related to group motivation. (.460**) 

\( H_A9 \): The perceived Inclusion (PeI) behaviours of the VTL are positively related to perceived group cohesiveness. (.426**) 

\( H_A10 \): The perceived Control (PeC) behaviour of the VTL are positively related to perceived group cohesiveness. (.323**) 

\( H_A11 \): The perceived Affection (PeA) behaviours of the VTL are positively related to perceived group cohesiveness. (.476**) 

\( H_A12 \): The combined level of expressed behavior of the VTL (Inclusion + Control + Support) are positively related to group cohesiveness. (.453**) 

\( H_A15 \): The virtual team’s level of cohesiveness is positively related to the group’s perceived motivation. (.525**) 

Null Hypotheses that are supported:

\( H_02 \): The perceived Control (PeC) behaviours of the VTL are not positively related to the team’s effectiveness.

\( H_013 \): The virtual team’s level of motivation is not positively related to the group’s effectiveness.
**H_{014}:** The virtual team’s level of cohesiveness is not positively related to the group’s effectiveness.

In the next chapter, we will discuss these findings, some implications, and suggest some conclusions which may be drawn for practitioners and managers from these findings.
Chapter Seven
DISCUSSION

As we have seen in the review of the literature on leadership of virtual teams, the impact of a variety of patterns in leadership have previously been shown to have some effect on virtual team outcomes. Not surprisingly, this study confirms the positive relationship that leadership behaviour has on virtual team outcomes, and confirms the FIRO framework of behaviours as relevant in the discussion of patterns of effective leadership for such teams. Of the twelve hypotheses related to the relationship between leadership behaviours and team outcomes, eleven were supported by the data.

7.1 VT Leadership Behaviour and VT Effectiveness: Hypotheses 1-4

In correlational analysis we may not claim causality between the two variables tested, rather only point out inter-relationships, and in spite of using a 1-tailed test, we do not know the direction of the effects between leadership behaviour and the 3 dependent variables. However, we may interpret the findings further by assessing the $R^2$ or “coefficient of determination which is a measure of the amount of variability in one variable that is explained by the other” (Field, 2005, p. 128).” In this sense, leadership behaviours as a category explained very little of the variation in Effectiveness in this study, ($R^2 = .0193$ or 1.9 %). Inclusion had a slightly positive correlation with team effectiveness, which is not surprising given earlier findings such as Malhotra et al. (2007) and Cummings (2008). Affection, or Supportive behaviours, also unsurprisingly, was related to effectiveness outcomes, although the effect is not highly significant. Control, or initiating structuring behaviours as described by the 10 items under this rubric, did not
show a significant correlation with Effectiveness, which is somewhat unexpected. One possible explanation is that Structure may be not as important to the performance of highly virtual teams, such as were taking part in this study, as opposed to other “softer” factors such as the team’s internal working processes, personal interactions, need for visibility and personal support when working virtually. Although Inclusion, Control and Affection, as a combined factor of leadership behaviour did show a positive correlation with group effectiveness (.139*), these effects are not as large as normally assumed to be the case. There are apparently many other factors affecting the Effectiveness outcome aside from leadership behaviours solely; for instance, organisational support, technologies, travel budgets for face-to-face meetings, cultural diversity, just to mention a few. Another potential explanation may be that during the latter part of data gathering, in the six months leading up to the fulcrum of the economic crisis (in Fall, 2008) results for teams began to be more and more difficult to attain, in all respects under measurement, which may have had an impact on the sponsors’ evaluations of team effectiveness.

7.2 VT Leadership Behaviours and VT Motivation: Hypotheses 5-8

Team members’ motivation level seems to be most positively associated with higher Inclusion (.431**) and Affection/Support (.453**) on the part of the team leaders. Leadership behaviours as a category (Combined I-C-A, showed R=.460**) may be able to explain roughly 21% of the variation in Motivation in this study, \( (R^2 = .2116) \). As noted in the review of the literature, virtual team members face difficulties of isolation, feeling disconnected, lack of visibility, difficulties of getting information, all of which would seem to be remedied by a high degree of initiated interpersonal attention such as captured within the Inclusion and Affection rubrics of the FIRO framework. The more the leader exhibits participative behaviours (sharing information, soliciting input, encouraging team
members to interact with each other, staying in touch, etc.) the more the team member feels motivated to work on the group’s virtual tasks. Likewise, it suggests that in times of difficulty such as faced during the current economic crisis, team members respond favorably to the Supportive leadership behaviours described by the Affection rubric of the FIRO framework (nurturing, encouragement, praise for efforts, openness, listening with concern to team members’ worries, etc.) These behaviours can be thought of as “personal warmth” or “nurturance” (Macrosson, 2000), showing a combination of Inclusion and Affection behaviours, as previously suggested by research on mentoring (Siegel et al., 2001). Earlier empirical studies of motivation in virtual teams showed linkages between leaders’ supportive behaviours and motivation (Allen, 2005; Moore, 2008), and the impact of Inclusion, particularly recognizing accomplishments, an element of Transformational Leadership on motivation (Moore, 2008), both of which were confirmed by findings in the current study. Control, or initiating structure when interacting with team-members, is also significantly correlated to group perceptions of motivation (.329**) which is not unexpected, and confirms earlier findings (Malhotra et al., 2007; Moore, 2008). Virtual team members may need to feel there are clear guidelines, clear expectations, clear goals and a clear direction, as well as to feel that the leader takes the initiative to follow-up on task completion, as stated in the FIRO rubric for this behavioural area in the current study.

7.3 VT Leadership Behaviours and VT Cohesiveness: Hypotheses 9-12

Affection/ Supportive leadership behaviours as described by the set of 10 Supportive behaviours under the FIRO framework showed the highest correlational linkage to Perceived Group Cohesiveness (.476**), where Inclusion leadership behaviours came in a close second (.426**) and Control/Structuring leadership behaviours third position (.323**). Thus all three sets of leadership behaviours, as described by the FIRO
framework have some positive association with the emergence of perceived Group Cohesiveness in virtual teams. Leadership behaviours as a category (Combined I-C-A, showed R= .453**) may be able to explain roughly 20% of the variation in Cohesiveness in this study, (R² = .205). Although we may not predict this outcome from the independent variables, we do see a positive effect on group cohesiveness when the leader shows a high degree of expressed or initiated inter-personal activity in Inclusion, Control and Affection behaviours. By way of interpretation, it might be possible that the geographically-dispersed virtual team members, separated as they are by time-zone differences, having difficulties in meeting face-to-face, must be actively pushed to engage with one another by an inter-personally, highly active and engaged team leader? As one team leader in this study described his efforts to pull his team together into a closely-knit unit:

“It’s like herding cats! To get my team to work as a unit, to relate to each other frequently enough to build relationships, I must give them a model for how that looks. I exert tons more energy in building bonds between our members than I normally do when leading a team in the same office!”

Specific behaviours within this area may be quite easily taught to new virtual team leaders. Listening skills, showing appreciation for team members’ efforts even when not yet successful, remembering team member’s birthdays, anniversaries, and national holidays, may be thought of as “low-hanging fruit” which have a highly-leveragable impact on the team’s cohesiveness. Those leaders who find it natural and normal to exert this type of energy when working with people may find the job of leading virtual teams to come somewhat easier to them.

7.4 VT Motivation and VT Effectiveness: Hypothesis 13

However, somewhat surprising was the finding of no significant positive relationship between motivation and effectiveness in this study. One other study by Kirkman et al.
(2004) showed a positive relationship between virtual team empowerment and virtual team performance outcomes, leading us to also expect to see a similar outcome in this study. There may be other variables that intervene in the measurement of effectiveness. Most notably and probable, is the effect of the recession on the operating results of the virtual teams involved in the study. The poor economy during the data gathering phase may have caused the sponsors’ measures of team effectiveness to decrease. Thus, even when the teams were highly motivated, still they did not achieve their goals, produce on time, satisfy their customers, produce high quality or work productively, as measured by the Group Effectiveness questionnaire (Gibson et al. 2003). There are many other variables which moderate the impact of Motivation on Effectiveness as other researchers have discovered, i.e. interdependency of task, degree of virtuality, cultural differences and the usage of CMC technologies for communication. These variables have not been examined specifically in this study, although we have made efforts to control for some of these variables by stringent selection of participating teams according to controlled criteria.

7.5 VT Cohesiveness and VT Effectiveness: Hypothesis 14

Although other researchers have found linkages between cohesiveness and performance in traditional teams (Evans & Dion, 1991; Mullen & Cooper, 1994; Gully et al., 1995), as well as in virtual teams (Joshi et al., 2009) this linkage was not found to be significant in the current study (correlation coefficient 0.060). The measure of effectiveness used in the current study (Gibson et al. 2003) has been applied for the first time, in relation to Cohesiveness and Motivation indicators in virtual teams. To explain the lack of significant positive correlational effects, one might conclude that even if a group feels tightly bonded to one another personally and enjoys working together, that this
cohesiveness may not necessarily mean that the team produces better results. However, this outcome should not be interpreted to mean that Cohesiveness is not a desirable objective when building a virtual team; to the contrary, a tightly-knit team may be more motivated, as we have seen in the previous discussion. There are very likely many other mediating variables that have an effect on the Effectiveness measure of a virtual team. For instance, management’s providing of resources to support virtual team working may be inadequate during an economic crisis, and this may impact team effectiveness. This is seen in the fact that of the 31 teams, most team leaders (26) reported that their companies would not allow them to meet more than once annually face-to-face for the remainder of 2009 and into 2010, until the economic conditions improve. Meeting face-to-face has been seen to be quite important to building cohesiveness in teams (Kirkman et al., 2004; Hambley et al. 2007). Other leaders report that their companies do not feel it is necessary to provide better video-conferencing capacity which would improve the visual contact between team members during their teleconferences, as this is perceived to be very expensive. Much research has been done previously demonstrating the beneficial impact on team-interactions using all available visual teleconferencing technology to come closer to simulating face-to-face interaction (Manzevski & Chudoba, 2000; Kahai, Sosik & Avolio, 2003; 2004; Horowitz et al., 2006). In this regard, the Group Effectiveness Measure as developed for assessing cross-cultural teams (Gibson et al., 2003) was perhaps limited by its focus on purely business–related outcomes, rather than investigating other external factors that have been shown to have effect on virtual team’s performance. Thus, the addition of indicators of the degree of organisational support, technology and support resources provided for virtual team work might be desirable when using this measure in assessing virtual teams. This is an area of continued research
interest where researchers are seeking to build ever more effective and comprehensive measures of Group Effectiveness for global virtual teams.

7.6 VT Cohesiveness and VT Motivation: Hypothesis 15

This is the first time an empirical study of virtual teams examined the relationship between cohesiveness and motivation. Interestingly, there seems to be a strong association between high degrees of perceived Cohesiveness and Group Motivation (.525**). Cohesiveness thus may be able to explain roughly 27.5% of the variation in Motivation in this study, (R^2 = .2756). In other words, highly cohesive groups may show higher motivation to do the virtual task. We may not conclude that higher cohesiveness causes higher motivation, only that a positive association exists. Other researchers point out the positive influence group cohesion has on motivating individuals to work towards team goals as opposed to their own individual goals and rewards (Ellemers et al., 2004; Hinds & Mortensen, 2005). Our finding supports this claim.

Some conclusions that may be drawn from this study:

As other researchers have pointed out, leadership behaviour does have a positive relationship with team outcomes, and effective, motivated and cohesive teams owe part of their positive functioning to the actions of leadership. We may conclude that, based on the findings of this study, leadership behaviours of Inclusiveness and Supportiveness are most highly related to Motivation and Cohesiveness; and that Cohesiveness is highly related to Motivation. This study supported the findings of earlier empirical research on Motivation of Virtual Teams (Allen, 2005; Moore, 2008), showing that Supportive and Inclusive leadership behaviour is highly related to higher levels of motivation. The findings also confirm the linkage between leader’s inclusive and supportive actions and
team cohesiveness found by Joshi et al. (2009). In addition, we found that the FIRO framework used in setting up the Leadership Behaviour measure was a valid way to test team members’ perceptions of leadership, showing linkages to virtual team outcomes.
Chapter Eight

CONTRIBUTIONS OF THE STUDY

Contributions to Research:
This study focused on the relationships between Leadership Behaviours, as described by the FIRO Theory of Interpersonal Relations, on team outcomes of Effectiveness, Motivation and Cohesiveness. The findings suggest that Inclusion (Participative), Control (Structuring) and Affection (Supportive) behaviours have a positive relationship with Cohesiveness and Motivation; Inclusion and Affection behaviours are positively related to team effectiveness, although these effects are smaller. The study also found a positive linkage between team perceived Cohesiveness and Motivation in virtual teams, representing a first for empirical testing of this relationship. The study offers insight into the applicability of the FIRO behavioural sets in Inclusion, Control and Affection to the question of virtual team leadership and shows that there are connections with leaders’ perceived actions and team outcomes.

Contributions to Practitioners:

Useful Indicator of Leader’s Interpersonal Relations Orientation
The FIRO theoretical framework was seen to have relevance to the challenge of leading virtual teams, as a tool for selecting and developing more effective virtual team leaders. Although impossible to predict that a certain pattern of leadership behaviour will consistently produce certain team outcomes, there is an indication that leaders’ relatively high levels of Expressed Inclusion and Expressed Affection, and moderate levels of Expressed Control behaviours would appear to be associated with more cohesive and motivated virtual teams. All of the findings of this study point to the necessity for leaders of virtual teams to actively initiate inter-personal interactions with team-members, in all
three basic human interaction areas, Inclusion, Control and Affection. Thus, the results of this study suggest the continued usage of the FIRO-B psychometric assessment (based upon FIRO theoretical framework) in leadership coaching and development for virtual team leaders. It also suggests that the Virtual Team Member Survey (Appendix 3) used in the current study, might be used as a 360-degree feedback tool to find out how each team leader is performing against the virtual team leader’s inter-personal profile. Team leaders who have the skills, knowledge and capabilities of leading a virtual team might be discovered in this way, and encouraged by HR and their mentors, to take on the ultimately challenging assignment of leading highly virtual, highly dispersed global virtual teams. Deficits in leader competence in the three inter-personal areas might be identified and coaching or training interventions devised to address the gaps for virtual team leaders.

Useful Tool for Developing Flexible Leadership to Fit Team Development Phases

At a group level, there would seem to be differences in what the team needs from a leader at different stages of team’s life cycle as described by Tuckman (1965): The newly forming group (Forming) requires more initiated Inclusion behaviours from the leader in order to support the team in getting to know each other’s talents, skills, backgrounds, strengths, etc. so that each person feels like a real member of the team. Phase 2 of a team’s evolution involves Storming, where issues of Control take the forefront of activity and team members seek to test the limits of the leader’s authority over them, their competence to lead is tested, often openly by team members, who seek to find their own ranking in the group. In this phase, a leader is required to exhibit more Control behaviours, offering clearer direction, clarifying responsibilities, specifying how things are to be done, and asserting his/her authority. Later phases of development, i.e. Norming and Performing, are
where there is a possibility to exhibit more expressed Affection, ex. supportiveness, openness, mentoring, nurturing and open, honest exchange of true feelings and views. Leaders are able to adjust their expressed behaviours according to the needs of the team, given the phase of development, as long as they themselves are aware of their own interpersonal interaction needs (Schutz, 1994; Thompson, 1995). The Virtual Team Member Survey may provide useful feedback on which set of behaviours seems to be most noticeable by team members, allowing the leader to make a choice to adjust his/her behaviours to fit the developmental needs of the team, based on its phase of development.

*Useful Indicator of Virtual Team “Health”*

The second implication for HR practitioners and virtual team process managers is in the area of virtual team development. Most of the leaders in the current study concurred with the findings of current virtual team research that it is quite difficult to get honest and direct feedback from virtual team members about the internal working processes of teams and thus were highly appreciative of the feedback provided by the Virtual Team Member Survey report and the individual coaching given by the researcher following data collection. Team members’ reticence to tell the leader “bad news” or give negative feedback, is not only a phenomenon seen in Asian cultures; it is pervasive when teams are newly formed and still unsure about the level of trust and openness that they may expect from the team. As an answer to this predicament, the survey instrument used in the current study may be duplicated and used to verify the “health” of virtual teams, at various stages of their development. In this way, Human Resources may provide their virtual team leaders with ongoing support for improving the team’s working processes, thus maintaining motivation and cohesiveness. Problem areas may be flagged earlier and corrected more quickly than otherwise possible, thus avoiding potential additional cost.
or hardship for both team leaders and members. As this is a fully anonymous instrument, team members will feel more at liberty to give their feedback to the team leader, and accelerate the development of a more effective team.
Chapter Nine

LIMITATIONS AND FUTURE RESEARCH

Limitations:
This study was confined to the examinations of three sets of interpersonal behaviour expressed by virtual team leaders, in correlation with three team outcomes. This places limitations on the conclusions that may be drawn about virtual team leadership, due to the existence of many other kinds of leadership behaviour that are also relevant to the effective leadership of virtual teams. Some aspects that are also salient to the question of leadership include emotional intelligence of the leader (empathy, patience, adaptability, self-control, conflict-resolution skills, etc.); rewards and incentive systems; measurement of team member contributions; organisational culture; organisational support infrastructure for virtual team working; and leadership training for virtual team leaders. All of these variables might be investigated in ongoing research on leadership effectiveness of virtual teams. In regard to team member responses, we recognize the existence of moderating variables which affect team members’ perceptions of leadership, most notably cultural differences, which are not among the variables examined by this study. Other extraneous variables which may affect the motivation and cohesiveness of global virtual teams are the technologies used by the team, the number of face-to-face meetings held annually, the size of the team, maturity of team members and tenure in their jobs, how long the team has worked together as a unit, and the degree of task interdependence. Other research has pointed to the moderating influence these factors have on team outcomes. As this study was designed with some of these factors in mind, and controlled for them (number of team members, age of team as unit, number of FTF meetings annually and task interdependence were among the list of criteria used to pre-select participants.) it was
intended to minimize the impact of these factors on the results. However, there are certain limits to how much we may generalize the results to all virtual teams, since we did not specifically include these aspects in the research design.

This study was limited by the relatively small number of teams participating (31). Although the original intention was to have 40+ teams participate, the research was hindered by a high rate of attrition of teams that originally planned to participate in the last phase of the data-gathering due to the economic crisis of Fall, 2008. The generalizability of the results of the study to the larger population is thus also limited. We obtained evaluations of the effectiveness of each team from the 31 team sponsors, which required assigning this score across all of the team members for each respective team. It is this researcher’s view, in hind-sight, that a much larger number of teams, pre-selected as being “effective” according to the objective measure as used in the Malhotra et al. (2007) methodology might have yielded a more accurate assessment of the variables correlations.

**Future Research:**

Previous studies have examined motivation (notably Moore, 2008 and Allen, 2005) of virtual teams, but have used motivation frameworks that focused on individual motivation (Maslow’s Hierarchy; Expectancy Theory respectively in the Moore and Allen studies) as opposed to group motivation. The current study used a motivation model based solely upon group motivation indicators, and thus provides a unique insight into the measurement of team motivation, which has been problematic for previous research on virtual teams. Future research in motivation of virtual teams would benefit from the usage of this measurement instrument as it captures a broader spectrum of group motivation factors than previous measures used to look at motivation of virtual teams.
It is suggested that the survey instrument might be further tested within large organisations using a large number of virtual teams, in order to improve the relevance of the survey, as well as to capture additional aspects of virtual teamwork. For instance, there are several specific variables that remain to be tested as moderating factors between leadership behaviours and VT motivation and VT cohesiveness: (1) degree of virtuality (Gibson & Gibbs, 2006); (2) cultural diversity factors (Gibson et al., 2001); (3) team size; (4) team leaders’ level of emotional intelligence (empathy, adaptability, problem-solving, self-control factors etc.); (5) virtual meeting practices (how meetings are run, degree of social vs. task content built into the agendas, frequency of virtual meetings) and (6) team phase of development (Tuckman, 1965) to name only a few areas of interest. It is hoped that the findings of this study also inspire other researchers to further test the FIRO framework as a valid platform for examining leadership behaviours in the virtual environment as well as in other business settings. Additional research would provide practitioners in Human Resource and Organisational Development more evidence for application areas of the FIRO-B psychometric assessment as well as practical ways to intervene with dysfunctional or under-performing virtual teams in order to make adjustments to internal team working processes or team leadership patterns.

**In conclusion:**

Virtual teams are becoming a permanent fixture of modern organisational life in today’s globe-spanning businesses. This trend may only be expected to increase due to the economic pressures faced by global companies, and the subsequent need to work more efficiently across time-zones and geographical separation. More and more teams will find
themselves working at higher degrees of virtuality than ever before, due to diminishing resources spent on travel budgets, thus reducing the number of face-to-face team meetings possible. In this environment, it is vitally important that virtual team leaders learn quickly what works well in increasing motivation and cohesiveness of such teams. It is hoped that the findings of this study may be used to improve the ways leaders and Human Resources thought-leaders approach the task of managing virtually.
REFERENCES


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Howard, T., (2004). *Relationship between geo-cultural identity and leadership characteristic preferences of followers in a virtual environment.* Thesis (PhD), Colorado State University, USA.


**APPENDICES**

**APPENDIX 1**

Reliability Testing of Perceived Leader Behaviours Questionnaire, Part I of Team Member Survey

N= 111 MBA students, China Europe International Business School

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<th>Case Processing Summary</th>
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1) Inclusion Items (10 questions)

**Reliability Statistics**

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2) Control Items (10 questions)

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3) Affection Items (10 questions) + 1 open ended question

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4) Overall Perceived Leader Behaviour Questionnaire

**Reliability Statistics**

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VT Leader Behaviour Questionaire: Part I of Team Member Survey

Questions related to Independent Variable 1: Expressed Inclusion Behaviours

6. My team leader asks me for my input, ideas, and suggestions regarding our tasks
9. My team leader takes the initiative to keep in contact with me.
11. My team leader keeps all team members fully informed about our team’s activities.
14. My team leader presents issues or questions for discussion in order to get input from all team members
15. My team leader invites me to take part in meetings
17. My team leader tries to incorporate team members’ suggestions into decisions
27. My team leader makes an effort to make members feel that their contributions are significant to the team’s success
29. My team leader encourages all of our team members to participate fully during our meetings
31. Whenever my team leader gets a new piece of information that might help us (team members), he/she immediately communicates with us
34. My team leader makes efforts to encourage all of us to exchange information with each other

Questions related to Independent Variable 2: Expressed Control Behaviours

8. My team leader establishes structured tasks, procedures and policies for the way I should do my work in the team
10. My team leader pushes the group to adopt his/her own ideas during team discussions
12. My team leader sets a clear direction for the team
16. My team leader provides clear guidelines for accomplishing my assigned tasks
18. My team leader directs the activities of the team
20. My team leader tries to influence the opinions of team members related to team activities
24. My team leader gives me clear directions to tell me what I should do
26. My team leader makes winning a priority for our team
32. My team leader makes efforts to establish his/her authority in team
33. My team leader checks with me regularly to see how I am doing in my work

Questions related to Independent Variable 3: Expressed Affection/Support Behaviours

7. My team leader expresses personal appreciation for my efforts towards achieving our goals, even if I am not yet successful
13. My team leader acts in a kind way towards me
19. My team leader praises team members in a personal way for their contributions
21. My team leader provides me with personal mentoring to help me in my development
22. When our team is under pressure, my team leader gives us personal reassurance and support to keep us going
23. My team leader listens to my concerns with genuine interest
25. My team leader makes efforts to get to know me as a person, including my personal life (family, hobbies, interests, etc.)
28. My team leader shares openly about his/her true feelings related to our team’s work.
30. My team leader remembers team members' birthdays, anniversaries, national celebration days, etc.
35. My team leader lets us know that he/she is interested in hearing about our concerns or worries related to either work-related or personal issues

Response Scale:

Always (1); Often (4); Sometimes (3), Rarely (2); Never (1)
37. How many of your group members fit what you feel to be the idea of a good team member?
   All of them (5); Most of them (4); Some of them (3); Only a few of them (2); None of them (1)

38. To what degree do you feel that you are included by the group in the group's activities?
   I am included in all the group’s activities (5); I am included in almost all of the group’s activities (4); I am included in some of the activities, but not in some others (3); I don’t feel that the group includes me in very many of its activities (2); I don’t feel that the group includes me in any of its activities (1).

39. How much do you like doing the activities in which you participate as a member of your group?
   Like all of them very much (5); Like almost all of them (4); Like some of them, but not others (3); Like very few of them (2); Like none of them (1)

40. If most of the members of your group decided to dissolve the group by leaving, how hard would you try to persuade them to stay?
   Would try very hard to persuade them to stay (5); Would try to persuade them to stay (4); Would make no difference to me if they stayed or left (3); Would not try to persuade them to stay (2); Would definitely not try to persuade them to stay (1).

41. If you were asked to participate in another project like this one, would you like to be with the same people who are in your present group?
   Would want very much to be with the same people (5); Would rather be with the same people than with most others (4); Makes no difference to me (3); Would rather be with another group more than present group (2); Would want very much to be with another group (1).

42. How well do you like the group you are in?
   Like it very much (5); Like it fairly well (4); Neutral (3); Don’t like it very much (2); Dislike it very much (1).

43. How often do you think your group should meet virtually?
   Much more often than at present (5); More often than at present (4); No more often than at present (3); Less often than at present (2); Much less often than at present (1).

44. How often do you think your group should meet face-to-face?
   Much more often than at present (5); More often than at present (4); No more often than at present (3); Less often than at present (2); Much less often than at present (1).
Team Member Survey, Part III: Group Motivation Questionnaire (adapted from Enciso, 2000)

Based upon the CANE model of motivation (Clark, 1998), following the model:

\[
\text{Commitment} + \text{Mental Effort} = \text{Motivation}
\]

\[
\text{Commitment} = \text{Values} \times \text{Emotion} \times \text{Personal Agency}
\]

\[
\text{Mental effort} = \text{Self-Efficacy} + \text{Group Efficacy (Collaboration} + \text{Coordination)}
\]

( R ) = Reverse-Coded Items

Value Items:

55. Our task appears to be interesting to many people on the virtual team.
58. I like this virtual assignment because I’m good at this kind of job.
62. The time invested in this virtual task is a welcome break from the rest of my job.
76. While working on this virtual task, I expect to learn new skills from my team-mates.
77. I do not like the project work as much as I like the benefits I get from finishing the project. ( R )

Emotion Items:

46. I think we are a very positive group of people.
50. Some people feel no sense of pride in their work. ( R )
53. Some team members are angry because of past work experiences. ( R )
63. I feel a sense of pride in the team’s work.
73. I think that my team-mates are happy about the team’s accomplishments.
80. Team members seem to be satisfied with the progress of the team.

Personal Agency Items:

45. I believe the organisation will provide the necessary internal resources to make this virtual team succeed.
49. Team members believe they will be allowed to make the necessary decisions without management intervention.
51. The company’s culture will not allow our team to be successful. ( R )
54. Management has provided the necessary consulting and technology resources in order for the team to be successful.
66. I believe this team’s virtual task is aligned with company objectives and will receive the support needed.
67. Decisions are not made fast enough because too much management approval is required. (R)

Self-Efficacy Items:

48. I have all the skills needed to perform my specific team role very well.
56. Most of my team-mates can do this job better than me. (R)
60. My future in this company is limited because of my lack of job skills. (R)
72. I am confident I can rapidly learn and use new technologies and tools needed to get my job done.
75. I have confidence in my ability to perform my role on the team.
78. When my performance is poor, it is due to my lack of ability for part of the job. (R)
81. I am confident of my job skills and abilities.

Group Efficacy Items: (1) Collaboration Items

47. Responsibilities have been clearly delineated to each member.
61. Some members of the team do not contribute as much as they could. (R)
64. There is a high level of cooperation on the team.
65. Team members seem to respect each other’s ability to work together.
70. It is important for our team to work together.
74. I think our team members are very skilled at planning and coordinating tasks.
79. The workload is fairly distributed among team members.
82. My virtual team works well together.

Group Efficacy Items: (2) Coordination Items

52. My team members know their limitations and will ask for help before the problem gets out of control.
57. I can trust my team-mates to finish their own tasks on time.
59. Team members have different but necessary skills for their roles in this project.
68. Each team member was assigned to the virtual team because of his/her expertise in a specific area of the job.
69. All team members have excellent job skills.
71. I have confidence that my team-mates have the necessary skills for the job.
83. I feel I have the skill necessary to perform my role on the team.

Response Scale:

Strongly agree (5), Agree (4), Neutral (3), Disagree (2) and Strongly disagree (1).
GROUP EFFECTIVENESS QUESTIONNAIRE FOR TEAM SPONSORS (from Gibson et al. 2003)

( R) = reverse coded items

Goals:
1. This team fulfills its mission.
2. This team accomplishes its objectives
3. The team meets the requirements set for it.
4. This team achieves its goals.
5. This team serves the purpose it is intended to serve.

Customers:
1. This team’s customers are satisfied.
2. The team’s customers are happy with the team’s performance.
3. This team is responsive to its customers.
4. This team fulfills the needs of its customers.
5. This team respond to external demands.

Timeliness:
1. This team meets its deadlines.
2. This team wastes time. ( R )
3. This team provides deliverables (e.g. products or services) on time.
4. This team is slow. ( R )
5. This team adheres to its schedule.
6. This team finishes its work in a reasonable amount of time.

Quality:
1. This team has a low error rate.
2. This team does high quality work.
3. This team consistently provides high quality output.
4. This team is consistently error free.
5. This team needs to improve the quality of its work. ( R )

Productivity:
1. This team uses too many resources. ( R )
2. This team is productive.
3. This team is wasteful. ( R )
4. Inputs used by this team are appropriate for the outputs achieved.
5. This team is efficient.

Response Scale: Very Accurate (6) ; Slightly Accurate (5); Uncertain (4) ; Slightly Inaccurate (3); Mostly Inaccurate (2); Very Inaccurate (1)
Invitation to Participate in Virtual Teams Research Project:
“Overcoming Barriers of Time and Distance: Motivating Virtual Teams”

Virtual teams have become a permanent fixture of day-to-day life within many global organisations, yet business leaders continue to grapple with the difficulties of working virtually. Challenges include frustrations created by the distances that separate team members, the difficulties of crossing language and cultural barriers, dealing with time zone differences, compounded by the ordinary challenges of meeting business objectives.

Your company’s Human Resource Department would like to invite you, as a member of a global, virtual team, to participate in an on-line research project taking place from March-December 2008, which will investigate the key success factors for leading and working with others in a virtual setting. As a result of your participation, you will gain useful insights into how virtual teams work best and practical suggestions for how to maximize team motivation in a virtual setting.

Your team leader will be forwarding to you in the coming days an on-line link to the web survey. This survey is called the Virtual Team Work Survey and consists of 82 questions, which will take approx. 15-20 mins. to complete. These questions relate to each team member’s observations of their leaders’ behaviours in leading the team, their perceptions of their motivation and group cohesion.

Your team leader kindly asks for your candid input to help him/her gain insight into the current working processes of your team in order to make the team even stronger in future. All team members’ answers are summarized anonymously, for the purposes of discussion with your team leader and with your team (optional). The survey is completely confidential and results will not be used for any purpose other than the current research study. See attached Statement of Confidentiality, which has been signed by Vice President HR.

If you have any questions, please do not hesitate to contact me, (Nancy Jenster, the study director) at nancyjenster@yahoo.com. I thank you very much for your willingness to participate in the survey.

Nancy P. Jenster
DBA Candidate, Grenoble Ecole de Management
Statement of Confidentiality

You have been invited to be a participant in a research study related to the effectiveness, motivation and leadership of virtual teams. Your HR Department has agreed to the conditions of confidentiality described here, and we would like to inform you of these, so that you will feel at ease in giving your full support to the project. There are three levels to the collection of data using three different types of survey questionnaires:

a. **Team Leaders**: A survey containing 21 questions will verify the leaders’ view of the team’s progress and to verify the areas of interest, to provide structure for the (optional) team feedback meeting, scheduled within a two week period following survey collection.

b. **Team Members**: A survey containing 82 questions, related to their perceptions of team leaders’ behaviours, their perception of their group’s internal functioning and their motivation factors. Results provide input to the (optional) team meeting as well as to the statistical analysis of inter-relationships between the variables under study, for the final report, summarized into one whole data-set.

c. **Team Sponsors**: A survey containing 25 questions provides an objective measure of the team’s effectiveness. The supervising sponsor, to whom the leader of each team refers, is asked to answer this questionnaire. The results are used only for the analysis of relationships between team responses and effectiveness, and as a key input to the data summary and final report. The responses are not reviewed with the individual leader of each team, nor with the team members.

We agree that:

1. Data related to individual team leaders’ behaviours, actions and effectiveness are the sole and exclusive property of the team leader him/herself and the researcher, Nancy P. Jenster, Ph.D. candidate, at Grenoble Ecole de Management and Tongji University.

2. Data collected related to individual leaders, team supervisors or sponsors, and team members will not be made available to outside parties, i.e. Human Resources departments, management or other external parties.

3. Nancy P. Jenster, as the administrator of the research, agrees to keep all collected data confidential, and to use collected data exclusively for purposes of giving feedback to the individual leaders and to provide constructive coaching to the teams on a team-by-team basis only.

4. A summary of collected data will include a consolidated view of all responses given related to all leaders, sponsors and team members surveyed, at a company-level only, not at department-level, in order to protect the confidentiality of the individual participants.

We indicate our acceptance of these terms of confidentiality, by affixing our signatures here:

---

**Signed Date:**

---

**X**

Director, Human Resources

**Signed Date:**

---

**X**

Nancy P. Jenster

**Signed Date:**
GETTING STARTED E-MAIL TO PARTICIPATING TEAM LEADERS

Dear Team Leader (Name),

It was nice talking to you yesterday. Below are the 3 different web-links for (1) Your Team Members, (2) Your Sponsor (Boss or Supervisor who knows your team's activities well) and (3) YOU! Please let me know who the sponsor is. I also include for (2) and (3) some words of introduction which you may want to use to set the context for the survey. All input from team members is anonymous and confidential.

(1) Team Members Survey (82 questions, takes about 20 mins.):

Message of Invitation to the Team Members:

"Working as a virtual team is often alot more challenging than working face-to-face! As a team that has worked for some time now virtually, I would like to check on the "health" of our team's working process as well as how I am doing as a leader of the team. Nancy Jenster, a team facilitator, Volvo leadership instructor and PhD student from Grenoble Ecole de Management, at the invitation of our HR department, will be helping us to make small improvements in our team's internal working processes, using an on-line survey as input for us to discuss. The survey contains approximately 80 questions, and takes about 20 minutes to complete. All results are confidential and anonymous. Just click on this weblink and you are on the survey page.

Team Member Survey [link]

(2) Sponsor Survey (25 questions) Takes 5 mins. to complete.

"Dear (Team Sponsor),

This survey is to be used as an internal data-point in the Virtual Team Study which Nancy Jenster, a team facilitator and PhD student is doing at the invitation of our HR Department as part of her doctoral research. See attached Invitation letter and Statement of Confidentiality. This survey is meant to serve as an objective measurement of my team's performance, and is NOT going to be presented to me or discussed with me, merely used as a control for her data analysis. I appreciate your candid answers to these 25 questions about the effectiveness of my Virtual Team (Name:____________), at your earliest convenience. Thanks!

Sponsor Survey [link]

(3) Leader Survey for YOU alone (gives me background info. to structure follow-up conversations with you; 21 questions)

Leader Survey [link]

I would appreciate you CC-ing me on your emails to the team members and your sponsor, so I can record their names, and make sure I know when everyone has finished the surveys. Then I will be in touch with the summary and talk more about it with you.

Please feel free to let me know if there are any questions or if anyone needs any other clarifications. Thanks for all your support!

/Ci zhi/Venlig hilsen/ Best regards

Nancy P. Jenster

Shanghai, China 201206
Statistical Analysis Results

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Inclusion Distribution  | Control Distribution  | Affection Distribution

Motivation Distribution | Cohesiveness Distribution | Effectiveness Distribution

Figure 12: Histograms of Frequency Distributions for all variables
## Test of Homogeneity of Variance

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### Figure 13: Testing for Homogeneity of Variance between Groups 1-4 using Levene’s Test

The significance of the Levene’s statistics for Motivation and Effectiveness are <0.05, therefore indicating that significant differences exist between the variances of the groups for Motivation and Effectiveness variables. This indicates non-parametric data for these two variables thus supporting the need to use non-parametric tests for bivariate testing of this data against the Independent variables.
One further test of the normality of the data distributions within each variable set but split out for each of the four participating companies shows non-parametric distributions, also seen in the Q-Q Plots, where deviation from normal distribution is apparent for some of the companies.

### Tests of Normality

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* This is a lower bound of the true significance.
  a Lilliefors Significance Correction

**Figure 14: K-S and S-W Tests of Normalcy for Groups 1-4**

Groups show S-W significance values <0.05 for Inclusion (group 1 and 4); Affection (Group 4); Effectiveness (all groups), thus indicating non-parametric distribution for these variables.
Figure 15: Q-Q Plots, Examples of intra-company deviations from normal distribution, shown for Inclusion variable for companies 1, 3 and 4

Figure 16: Q-Q Plots, Examples of intra-company deviations from normal distribution, shown for Affection variable for companies 1, 3 and 4

Figure 17: Q-Q Plots, Examples of intra-company deviations from normal distribution, shown for Effectiveness variable for companies 1, 3 and 4
Figure 18: Q-Q Plots, Examples of intra-company deviations from normal distribution, shown for Motivation for companies 1, 3 and 4

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<tr>
<th>Inclusion</th>
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Figure 19: Example of Data Set for Independent and Dependent Variables