The development and evaluation of a second-order factor structure for the Leadership Behaviour Inventory (LBI)

Nikki Solomon

Thesis presented in partial fulfillment of the requirements for the degree of Master of Commerce at the University of Stellenbosch

Supervisor
Prof CC Theron

December 2006

DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature: Date:

ABSTRACT

The aim of this study is to derive a theoretically justifiable hypothesis on the second-order factor structure of the Leadership Behaviour Inventory (LBI). The available empirical evidence on the validity of the measurement and structural models underlying the Performance Index (PI) together with the positive results on the LBI, allows the opportunity to proceed with the task of explicating and evaluating a comprehensive leadership-organizational unit performance structural model. Before this can be undertaken, however, a good fitting second-order factor structure for the LBI needs to be developed. The second-order factor structure proposed by Avolio, Bass and Jung (1999) for the Multifactor Leadership Questionnaire (MLQ) is adapted, applied to the LBI and tested empirically. The results suggests a reasonable to mediocre fitting model that clearly outperforms the independence model, however, fails to satisfactory capture the complexity of the processes which underlie the LBI.

OPSOMMING

Die doel van hierdie studie is om ‘n teoretiese geregverdigde hipotese ten opsigte van die tweede-orde faktorstruktuur van die Leadership Behaviour Inventory (LBI) te ontwikkel. Die beskikbare empiriese getuienis oor die geldigheid van die metings- en strukturele modelle onderliggend aan die Performance Index (PI) tesame met die positiewe bevindinge oor die LBI, bied die geleentheid om met die ontwikkeling van ‘n omvattende leierskap-organisatoriese eenheid prestasie strukturele model voort te gaan. Alvorens dit gedoen kan word, moet ‘n goedpassende tweede-orde faktor-struktuur egter vir die LBI gevind word. Die tweede-orde faktor-struktuur soos voorgestel deur Avolio, Bass and Jung (1999) vir die Multifactor Leadership Questionnaire (MLQ), is aangepas, toegepas op die LBI en empiries getoets. Die resultate dui op ’n redelike tot middelmatige passende model wat die onafhanklike model oortuigend oortref maar wat nie werklik oortuigend daarin slaag om die kompleksiteit van die prosesse onderliggend aan die LBI vas te vang nie.

ACKNOWLEDGEMENTS

The author wishes to thank Professor C. C. Theron for all his assistance, support and guidance for the duration of this research project. All his assistance is much appreciated and valued.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1
INTRODUCTION, RESEARCH OBJECTIVES AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

Today, the work environment is characterized by quite high levels of turbulence, uncertainty, discontinuous change and global competition. Most companies, whether they are large or small, have to deal with competition for critical resources and market opportunities, not only from competitors in their home market but also from other parts of the world. This has a huge impact on many organizations as they would have to continually cope with new situations and challenges in order to survive and prosper in today's competitive environment (Lussier & Achua, 2004; Noe, Hollenbeck, Gerhart & Wright, 1997).

In recent years, many organizations around the world have been affected by a number of economic, political and social upheavals that have gathered momentum in most parts of the globe. For example, greater demographic diversity of workforces, a faster pace of environmental and technological change, more frequent geopolitical shifts affecting borders and distribution of power among nation states, and increased international competition (House, 1995). In most industries, there is unprecedented unpredictability and uncertainty, that is, turbulence. The challenge facing these industries is how to continually cope with new situations in order to survive and prosper (Day, Zaccaro & Halpin, 2004; Lussier & Achua, 2004). This has serious implications for organizations but meeting these challenges will be necessary to create value and to thrive in the marketplace (Noe *et al.*, 1997).

Within South Africa, organizations are currently struggling to remain competitive in the face of all these challenges and have to deal with increasing competition from foreign and domestic competitors (Theron, Spangenberg & Henning, 2004). The work environment for South African business organisations is fast-moving, extremely complex and is complicated by immense volatility, sensitivity and international turmoil (Pretorius, 2001). In 1994, South African society became a democracy and as a result this lead to the opening-up of commerce and industry to foreign competition and a major transformation was required of public and private organizations (Spangenberg & Theron, 2002). South Africa is experiencing a number of changes with this redirection of its society from the apartheid of the past to a multi-racial society (Hayward, Davidson, Pascoe, Tasker, Amos & Pearse, no date). As a result of this transformation, the capability to lead change becomes of utmost importance. The multi-faceted changing landscape of South African society offers exciting opportunities and challenges to organizational leaders (Cotter, 2002). To effectively meet this challenge leaders as well as managers need to have the necessary skills and abilities required to lead others, drive transformation and effectively manage performance of their work units (Spangenberg & Theron, 2002).

As organizations struggle to maintain their competitive market positions, the focus moves quite strongly onto the leader's role in the organization (Theron, Spangenberg & Henning, 2004). There tends to be agreement in the literature (Bass, 1997; Maritz, 1995; Mullins, 1999; Wall, Solum & Sobol, 1992) that leadership plays an important role in the success or failure of an institution. There seems to be a relationship between the characteristics and behaviour of a leader and the performance of the work unit that he/she is accountable for. Organizational units therefore reflect, through the level of performance that they achieve, the quality of their leadership. The leader's effectiveness is therefore reflected by the performance of his/her work unit. Leaders should make a difference in their followers' performance and should also make a difference as to whether their organizations succeed or fail (Hayward *et al.*, no date; Robbins, 1996). Leaders responsible for a work unit are after all required to achieve specific unit objectives through specific leadership outcomes (Theron, Spangenberg & Henning, 2004). Consequently, interest centres on the leader's role of influencing the performance of his/her subordinates in the individual and work unit contexts.

As a result of the perceived pivotal role of leadership in an organizational unit's performance, there has been a focus on the competencies and competency potential (SHL, 2000; 2001) of successful or effective leaders. Spangenberg and Theron (2002) developed a comprehensive leadership behaviour index (LBI) to identify those latent leadership competency dimensions that a leader does not perform well on and to be able to improve on those dimensions to enhance his/her effectiveness and in turn unit performance. The LBI is a diagnostic tool that can assist in providing leaders with a comprehensive insight into leadership behaviours, from environmental diagnosis, visioning, preparing the organization for change and implementing the vision to effectively managing work unit performance. The main objective is to be able to assess the range of capabilities which are needed by leaders and managers to implement major change while sustaining unit performance in the South African context (Spangenberg & Theron, 2002).

Spangenberg and Theron (2002) also developed a generic, standardized unit performance measure (PI) that includes the unit performance dimensions for which the unit leader could be held responsible. They identified eight unit performance dimensions for which a unit leader could be held responsible, namely: production and efficiency; core people processes; work unit climate; employee satisfaction; adaptability; capacity; market share/scope; future growth. When evaluating success of an organizational unit, all eight aspects should be assessed (Spangenberg & Theron, 2002).

Performance on these dimensions by an organizational unit is not the outcome of a random event but rather systematically determined by an intricate nomological network of latent variables. To be able to rationally and purposefully improve the performance of an organizational unit those latent dimensions must be known as well as how they combine to affect the various performance dimensions. Leadership characteristics and behaviour will probably play an important role in determining organizational unit performance. The effect of leadership variables on unit performance would probably not be direct but would be mediated through a layer of leadership outcome latent variables. Situational variables could also moderate the effect of leadership on unit performance (Bass, Avolio, Jung & Berson, 2003).

To purposefully and rationally affect improvement in organizational unit performance through leadership development, the manner in which leadership competency potential, leadership competencies and leadership outcomes combine to determine unit performance, needs to be accurately understood. The manner in which leadership impacts on the performance of an organizational unit, should therefore be captured in a comprehensive leadership-unit performance structural model that would explain the way in which the various latent leadership dimensions affect the endogenous unit performance latent variables. This is the intention of Spangenberg and Theron (2002). The evidence reported in Theron, Spangenberg and Henning (2004) on the validity of the measurement and structural models underlying the PI, together with the results on the LBI reported in Spangenberg and Theron (2002), opens the way to proceed with the task of explicating and evaluating a comprehensive leadership-unit performance structural model. However, to do so by linking all twenty-four first-order leadership dimensions, right from the start, to the eight latent variables currently comprising the basic unit performance structural model seems somewhat overly ambitious. Isolating a good fitting second-order factor structure for the LBI would simplify model development considerably. Constructing and motivating a leadership-unit performance structural model in terms of fewer but more extensive latent leadership variables would be a much easier task. Once a basic leadership-unit performance structural model has been explicated it will hopefully be easier to link the first-order leadership dimensions to the latent variables, which comprise unit performance through elaboration of the basic model. Theron and Spangenberg (2005) proposed a second-order factor structure for the LBI in terms of five oblique second-order factors. They report reasonable to mediocre model fit for the five-factor model although they concede (Theron & Spangenberg, 2005, p. 48) that the proposed model "fails to satisfactorily capture the true complexity of the processes underlying the LBI." Theron and Spangenberg (2005), however, also proposed an alternative second-order factor structure for the LBI based on the factor structure that Avolio, Bass and Jung (1999) proposed for the Multifactor Leadership Questionnaire (MLQ). They, moreover, recommended (Theron & Spangenberg, 2005, p. 49) that this latter hierarchical model "should also be evaluated empirically before proceeding to the actual development and testing of a leadership-unit performance structural model."

Therefore, it is the objective of this study to derive a theoretically justifiable hypothesis on the second-order factor structure of the LBI based on the Avolio, Bass and Jung (1999) second-order factor structure proposed for the MLQ and to empirically test the hypothesis by confronting the second-order measurement model with data. In accordance with the suggestion made by Theron and Spangenberg (2005) and with their permission granted to use such data, the empirical model fitting will be performed on the same data set that had been used to evaluate the five-factor model so as to facilitate the comparison of model fit across the two models.

The proposed second-order factor structure for the LBI is derived from the Avolio *et al.* (1999) second-order factor structure proposed for the MLQ in chapter 2. The confirmatory factor analysis used to empirically evaluate the proposed second-order factor structure is described in chapter 3. The results of the analysis are presented and discussed in chapter 4. The conclusions of the study and recommendations for future research are presented in chapter 5.

CHAPTER 2
THE DEVELOPMENT OF A SECOND-ORDER LEADERSHIP MEASUREMENT MODEL FOR THE LEADERSHIP BEHAVIOUR INDEX (LBI)

2.1 THE LEADERSHIP BEHAVIOUR INDEX (LBI)

The LBI is founded on an extensive interpretation of the leadership construct, which encompasses elements of leadership, management and supervision. The construct of leadership as measured by the LBI is thus quite broad. When attempting to clarify the constitutive meaning of the leadership construct as measured by the LBI the distinction between management, supervisory leadership and general leadership needs to be taken into account. House (1995, p. 413) defines management as "behaviour of a person in a position of formal authority that results in compliance of organizational members with their normal role or position requirements". Supervisory leadership is defined as (House, 1995, p. 413) "behaviour intended to provide guidance, support, and corrective feedback for the day-to-day activities of work unit members". General leadership is (House, 1995, p. 413) "behaviour of individuals that gives purpose, meaning, and guidance to collectivities by articulating a collective vision that appeals to ideological values, motives, and self-perceptions of followers resulting in (1) the infusion of values into organizations and work, (2) unusually levels of effort on the part of followers above and beyond their normal role or position requirements, and (3) follower willingness to forgo self-interest and make significant personal sacrifices in the interest of a collective vision."

General leadership tends to fall quite strongly within the realm of charismatic or transformational leadership. Behaviours that are included are visioning, providing meaning, inculcating values and eliciting unusual levels of effort from employees who go beyond self-interest to achieve the vision. Management and supervisory leadership is concerned with ensuring that employees achieve work/task requirements, providing employees with support and providing the necessary feedback (Spangenberg & Theron, 2002). Charismatic or transformational leadership (general leadership) comprises the core of the leadership construct as interpreted by the LBI, while elements of management and supervisory leadership also significantly contribute to the construct (Theron & Spangenberg, 2005).

2.2 THE NEOCHARISMATIC LEADERSHIP PARADIGM

Since the mid-1970s, there has been a substantial body of theoretical and empirical literature which concerns the behaviours that constitutes outstanding leadership. A number of theories have attempted to explain how leaders attain extraordinary accomplishments, such as, leading organizations successfully through times of crisis, turning losing industrial firms into generating profit, revitalizing stagnant and foundering organizations, or successfully reinventing organizations in response to dramatic environmental changes. These theories have been supported by empirical investigation. These theories are the 1976 theory of charismatic leadership (House, 1977), the attributional theory of charisma (Conger & Kanungo, 1987), and the transformational (Bass, 1985; Burns, 1978) and visionary theories of leadership (Bennis & Nanus, 1985; Saskin, 1988). This class of theory constitutes a new paradigm as it emphasizes leader follower values, motives, and self-concepts. Leaders are likely to articulate an ideological vision and emphasize the values inherent in the vision and attempt to identify with the collective. This new genre of theory is referred as the neocharismatic paradigm. This is because Weber's (1947) conceptualization of charisma is either implicitly or explicitly a central concept in all of these theories. The theories of the neocharismatic paradigm state that exceptionally effective leaders are visionary, offer innovative solutions to major social problems, encourages radical change, generally emerge as more effective under conditions of social stress and crisis, and induce significant social and organizational changes (House, 1995).

All these theories share some common characteristics. These theories explain how leaders are able to lead organizations to achieve outstanding accomplishments. They also explain how leaders are able to achieve extraordinary levels of follower motivation, admiration, respect, trust, commitment, dedication, loyalty, and performance. They also emphasize symbolic and emotionally appealing leader behaviours, that is, visionary, frame alignment, empowerment, role-modeling, image-building, exceptional risk-taking, supportive behaviours, and cognitively oriented behaviour – adapting, showing versatility and environmental sensitivity, and intellectual stimulation. These theories specify the leader effects on followers which include self-esteem, motive arousal and emotions, identification with leader's values, vision, and the collective, as well as follower satisfaction and performance. A number of studies (House, Spangler & Woycke, 1991; Pillai & Meindl, 1991; Waldman, Ramirez & House, 1996; Waldman, House & Ramirez, 1996) investigated the merits of these theories and concluded that this genre of leadership results in high-level of follower motivation and commitment and well above average organizational performance, especially under conditions of uncertainty or crises (House & Aditya, 1997).

The challenges that South African organizations are facing and the number of important changes taking place, imposes substantial new role demands on leaders. Leaders are required to cope with these challenges and changes. To do so successfully will require not only management behaviours but also general leadership behaviours. South African leaders therefore, must be able to lead change, drive transformation and effectively manage the performance of their work units. Consequently, the neocharismatic paradigm outlined above is particularly relevant to South Africa. The model that, according to Spangenberg and Theron (2002), best captures the leadership competencies required by the demands placed on South African leaders, is that of Conger and Kanungo (Conger & Kanungo, 1998).

Conger and Kanungo's model of charismatic leadership (Conger & Kanungo, 1998) is a stage model which involves a process of moving organizational members from an existing present state towards some improved future state. During the initial stage, the leader critically evaluates the existing situation or status quo and the inclinations, abilities, needs and level of satisfaction experienced by followers. He/she must conduct an environmental assessment of what resources are available and what constraints may stand in the way of achieving the envisaged future state. The second stage deals with the actual formulation and conveyance of the envisaged future state. Thus, he /she formulates and articulates a vision to followers. During the final stage the leader attempts to build trust in the vision, demonstrates how the vision can be achieved and creates the conditions necessary to successfully implement a vision-serving strategy (Conger & Kanungo, 1998). This model measures leadership and the change process in three easily identified stages and is the base-line structure used to develop the LBI.

The LBI interprets leadership as a complex, continuous process expressing itself in an extensive array of inter-dependent behavioural actions and driven by an intricate nomological network of situational and person-centred latent variables. The process entails (a) the assessment of the internal and external environment of the unit; (b) the development and selling of an environmentally appropriate yet challenging vision for the unit; (c) the preparation of the unit for the implementation of the vision; and finally (d) the bold yet honest implementation of the vision by the continually monitoring, revitalizing, fine-tuning and orchestrating a multitude of prerequisites for unit success in terms of the vision

(Spangenberg & Theron, 2002). The LBI comprises four phases and twenty-four (first-order) dimensions. The twenty-four LBI dimensions are listed in Table 1 below:

TABLE 1
FIRST-ORDER LATENT LEADERSHIP DIMENSIONS MEASURED BY THE LBI

Assessment of the internal and external environment of the unit
Awareness external environment (Awex)
Identifies and interprets external developments that may affect unit performance. Understands the business and positioning of the organization
Awareness internal environment (Awin)
Interprets internal dynamics and identifies weaknesses that may affect unit performance
Development and selling of an environmentally appropriate yet challenging vision for the unit
Developing challenging vision (Visi)
Develops a vision that gives people a sense of purpose, is customer-focused and advances diversity of people
Building trust (Trus)
Builds confidence in the unit and visibly supports the missions and values of the unit
Articulating vision and enlisting followers (Arti)
Articulates a vision for the future that provides direction, excites followers and that inspires commitment in followers
Conceptualising strategy (Stra)
Builds strategies and plans based on thorough problem analysis and broad-based fact-finding. Considers consequences of decisions.
Preparation of the unit for the implementation of the vision
Enabling the leader: personal growth (Risk)
Identifies challenging opportunities for self-development and is committed to continuous learning. Risks new ways of doing things.
Enabling the leader: self-discovery and –management (Lead)
Has good insight into own capabilities, weaknesses and behaviour and manages him/herself well.
Empowering followers (Foll)
Facilitates the personal growth of followers and creates a “hassle” –free environment that provides ownership for work.
Optimising structures and systems (Syst)
Adapts structures, processes and procedures to support implementation of strategy in a changing environment.
Building culture (Cult)
Develops a culture of openness that facilitates employee diversity and participation and is directed at high performance.

Implementation of the vision
Influencing the external environment (Infl)
Builds the image of the organization and practices good citizenship.
Honesty and integrity (Hono)
Considers ethical implications of decisions, assures agreed upon values are adhered to and deals honestly with all stakeholders.
Decisiveness and hardiness (Deci)
Acts decisively and makes tough decisions. Performs effectively under stress and reacts positively to change and uncertainty.
Challenging current reality (Valu)
Challenges current thinking, reconsiders current practices and improves work methods.
Facilitating learning (Lear)
Encourages followers to express their ideas and feelings and develops full understanding for their problems. Promotes continuous learning.
Interpersonal skills (Mana)
Effectively handles interpersonal and group relations.
Showing concern for others (Trea)
Shows concern for the aspirations, needs and feelings of others.
Inspiring people (Insp)
Raises the aspirations, confidence and motivation of followers. Conveys the message convincingly.
Facilitating interdepartmental co-ordination (Coor)
Facilitates interdepartmental co-ordination and helps people to see the big picture.
Acting entrepreneurial (Acti)
Develops new ideas, seizes opportunities and initiates projects for the benefit of the unit.
Developing and implementing performance plans (Plan)
Ensures that employee and unit goals and plans support organizational strategy and that employees know what is expected of them.
Reviewing performance (Revi)
Provides followers with feedback about unit performance as well as with specific feedback about their own performance.
Rewarding performance (Rewa)
Acknowledges positive employee performance and behaviour; celebrates success.

(Theron & Spangenberg, 2005)

Spangenberg and Theron (2002) report in their initial study on the development of the LBI that significant and high to extremely high correlations occur between the first-order latent leadership dimensions depicted in Table 1. Theron and Spangenberg (2005) speculate on the possibility that these correlations could in part be explained by a complex interchange that exists between the first-order leadership factors. They conclude that this possibility should not be ruled out and that hypotheses on the presumed nature of these structural relations should in future be tested. The correlations observed between the twenty-four first-order latent leadership dimensions could, however, also be attributed to the existence of one or more second-order leadership latent variables (Avolio, Bass and Jung, 1999; Marsh and Hocevar, 1985).

These second-order leadership latent variables represent common themes shared by a number of first-order latent leadership variables (Bollen, 1989). Second-order latent variables are broader, more general constructs. Second-order latent variables do not, however, explain all the variance in the more specific first-order latent variables. There is systematic variance, unique to the more specific first-order latent variables, that is not related to the more general second-order factors (Hull, Tedlie & Lehn, 1995). Second-order leadership latent variables on the LBI should be interpreted as broad leadership competencies. A second-order leadership latent variable thus should be interpreted as the abstract common theme shared by the abstract common themes in a number of bundles of behaviour each of which constitutes leadership success because they each serve individual and unit performance.

Theron and Spangenberg (2005) suggested that the second-order factor structure reported by Avolio, Bass and Jung (1999) for the Multifactor Leadership Questionnaire (MLQ) could possibly be used (at least in part) to develop a second-order factor structure for the LBI. Bass (1985) developed the MLQ to measure transactional and transformational leader behaviour.

2.3 CHARISMATIC TRANSFORMATIONAL LEADERSHIP

Although many theorists recognized that leadership occurs at all levels of an organization and that the impact of these leaders contributes to the overall performance of the organization, there has always been a fascination with leaders who do more than the mundane, everyday activities (Chemers, 1997). Following the major recession of the 1970s, Peters and Waterman (1982), conducted an analysis of American 'successful' companies, in which they emphasized the role of the transforming leader. This kind of leader was seen as being able to articulate a vision for the organization, communicating this vision by his/her passion and charisma and defining a meaning for the organization and transforming its culture (Warr, 2002). Bryman (1992) described the models that emerged from this analysis as the 'new paradigm'. A number of models were identified as falling into this category, and included the models of charismatic leadership of House (1977) and Conger (1989), Saskin's (1988) notion of visionary leadership and a number of transformational leadership models, of which Bass's is the most famous. Thus, Bryman states that this 'new paradigm' approach sees leaders as managers of meaning, rather than in terms of their direct influence on the behaviour of subordinates (Warr, 2002). In the 1970s, behavioural theories of leadership effectiveness were quite dominant. Examples of these theories include path-goal theory (House & Mitchell, 1974); LMX theory (Graen & Cashman, 1975) and normative decision theory (Vroom & Yetton, 1973). Since the late 1980s, theories of transformational and charismatic leadership have been on the increase (Yukl, 1999). This growth in interest has coincided with significant geopolitical, social and economic changes. The charismatic and transformational leader represents a new genre of leadership that may be capable of steering organizations through the chaos of the twenty first century. According to this genre of leadership theories, these leaders attempt to transform the needs, aspirations, and values of followers from a focus on self-interests to a focus on the collective interests (Lussier & Achua, 2004). There have been a number of versions of transformational leadership which have been proposed by several theorists, including Bass (1985, 1996); Bennis and Nanus (1985); Burns (1978); Sashkin (1988); and Tichy and Devanna (1986, 1990). Refined versions of charismatic leadership have been proposed by several theorists, including Conger (1989); Conger and Kanungo (1987, 1998); House (1977); Shamir, House and Arthur (1993) which were all based on the ideas of Max Weber (1947) (Yukl, 1999).

The roots of transformational leadership theory are to be found in the writings of German sociologist, Max Weber (Yukl, 1999). He explained charisma as a form of influence on people's perceptions and belief that the leader possesses the gift of divine inspiration or supernatural qualities (Lussier & Achua, 2004; Northouse, 1997; Northouse 2004). Weber (1947) provided the most well-known definition of charisma: "a distinct social relationship between the leader and follower, in which the leader presents a revolutionary idea, a transcendent image or ideal which goes beyond the immediate…or the reasonable, while the follower accepts this course of action not because of its rational likelihood of success…but because of an effective belief in the extraordinary qualities of the leader" (Lussier & Achua, 2004, p. 341). He differentiated charismatic authority from the more traditional or legal/bureaucratic forms of authority. According to Weber, the gift of divine inspiration is the driving force that allows the leader to focus society's attention on the crisis it faces as well as on his/her vision for a better future (Lussier & Achua, 2004). Despite Weber's emphasis on charisma as a personality characteristic, he also recognized that followers played an important role in validating charisma in these leaders (Northouse, 1997).

The major application of charisma to the study of formal organizations can be found in House (1977). In his theory of charismatic leadership House defined charisma as the extraordinary levels of devotion, identification and emulation that are aroused in followers (Chemers, 1997). House developed a number of testable hypotheses about the characteristics and behaviours of charismatic leaders, situational factors and other issues. He also discussed a number of effects of charismatic leadership: followers trust in the truthfulness of the leader's beliefs, a degree of similarity of beliefs develops between the leader and the followers, affection for and obedience given to the leader, a degree of emotional involvement of the followers in the leader's mission, improved follower performance in their tasks, and a belief that the followers can contribute to the mission's achievement. House also described the characteristics of a charismatic leader. These include a high level of self-confidence, a tendency to dominate, a need to influence others, and a strong conviction in the integrity of one's own beliefs (Bryman, 1992; Northouse, 2004). House provided a framework that many later scholars could build on. His model was multi-dimensional including leader behaviours and dispositional variables, follower effects and situational variables (Conger, 1999). Furthermore, House's (1977) theory of charismatic leadership laid the groundwork for moving the study of transformational leadership in a quantitative, empirical direction. Many theorists following House continued to refine the psychological and behavioural characteristics of transformational leadership. These theorists broadened the definition of such leadership beyond charisma and brought its effects into the pragmatic domain of formal organizations (Chemers, 1997).

2.4 TRANSFORMATIONAL AND TRANSACTIONAL LEADERSHIP

There has been a strong focus in leadership research since the early 1980s on transformational leadership. According to Bryman (1992) transformational leadership forms part of "the New Leadership" paradigm. Transformational leadership is a process that changes and transforms individuals as well as involves assessing followers' motives, satisfying their needs and treating them as complete human beings. It is a process that subsumes charismatic and visionary leadership. Transformational leadership tends to be an encompassing approach that can be used to describe a wide range of leadership, from very specific attempts to influence followers on a one-to-one level, to very broad attempts to influence whole organizations and even entire cultures (Northouse, 2004).

The term transformational leadership was first introduced by Downton (1973) and its emergence as an important approach to leadership began with the work of the political sociologist James MacGregor Burns (1978). House (1977) published his work regarding the theory of charismatic leadership at about the same time Burn's book was published. Charismatic leadership is often described in ways that makes it similar to transformational leadership, if not at times even synonymous. House (1977) suggested that charismatic leaders act in unique ways that have specific charismatic effects on their followers. In the mid-1980s, Bass (1985) provided a more expanded and refined version of transformational leadership that was based on, but not fully consistent with, the prior works of Burns (1978) and House (1977) (Northouse, 2004).

2.4.1 Burns' theory of transforming leadership

Burns (1978) described leadership as the way leaders induce their followers to strive for certain goals that represent the values and the motivations, the wants and needs, the aspirations and expectations of the leader and the follower. The interaction between the leader and follower is based on different levels of motivation and power potential, including skill, which is in pursuit of a common or joint purpose. This interaction takes two different forms, namely transactional and transforming leadership. Transactional leadership occurs when an individual takes the initiative to make contact with others for the purpose of an exchange of valued things. Beyond this the relationship does not go any further. Transactional leadership is an exchange between a leader and follower. The relationship is merely based on an exchange of valued things. The parties do not have an enduring purpose that holds them together. Although a leadership act does take place, there is nothing that binds the leader and follower together in a mutual and continuing pursuit of a higher purpose (Burns, 1978). Followers receive certain outcomes (for example wages, prestige) when they act in accordance with their leader's wishes (Burns, 1978; Den Hartog, van Muijen & Koopman, 1997). Thus, the leader exchanges rewards contingent upon a display of desired behaviours. The leader initiates contact with subordinates in an effort to exchange something of value, such as rewards for performance, mutual support, or bilateral disclosure (Lowe, Kroeck & Sivasubramaniam, 1996). The values inherent in the exchange process include that of honesty, fairness, responsibility and reciprocity (Yukl, 1989).

Burns (1978) contrasted transactional leadership with transformational leadership. He thought of these two types of leadership as being at opposite ends of a continuum. He, therefore, viewed transformational leadership as being distinct from and an alternative to transactional leadership.

According to Burns, transformational leadership is a process in which leaders attempt to raise the consciousness of followers by appealing to their higher ideals and moral values. He viewed the transformational leader as one who engages with their followers and they raise one another to a higher level of motivation and morality (Bass, 1999; Burns, 1978; Dvir, Eden, Avolio & Shamir, 2002; Lowe *et al*., 1996). This type of leadership becomes moral in that it raises the level of human conduct and ethical aspiration of both leader and follower and thus it has a transforming effect on both (Burns, 1978). Higher aspirations or goals of the group are expected to transcend the individual and result in the achievement of significant change in work unit effectiveness. A transformational leader is someone who articulates a vision of the future that can be shared by followers, intellectually stimulates them and also takes into account individual differences among his/her followers (Lowe *et al*., 1996). In terms of Maslow's hierarchy of needs, transformational leaders attempts to satisfy the higher-order needs of followers, that is, to satisfy self-actualization needs rather than the lower-order needs. For Burns transformational leadership can be displayed by anyone in the organization in any type of position (Dvir, Eden, Avolio & Shamir, 2002; Yukl, 1989).

2.4.2 Bass' theory of transformational leadership

Bass and his colleagues contributed a great deal to the study of transformational leadership (Yukl, 1999). Their research programme helped to broaden the definition of charismatic or transformational leadership by making it more appropriate to the setting of complex, formal organizations (Chemers, 1997). Bass (1985) extended Burns' (1978) work by paying more attention to followers' needs rather than leaders' needs. He also suggested that transformational leadership could apply to situations where the outcomes were not positive, and by describing transformational and transactional leadership as two inter-related but separate continua rather than a single continuum with two mutually exclusive poles. Further, Bass (1985) also extended House's (House, 1976) work by providing more attention to the emotional elements and origins of charisma and by suggesting that charisma is necessary but it is not sufficient for transformational leadership (Northouse, 2004).

Bass (1985) defined transformational leadership in terms of the leader's effect on his/her followers. The leader motivates followers to do more than they would be expected to do under normal circumstances and as a result followers feel trust, admiration, loyalty and respect towards their leader. The leader influences his/her followers by arousing strong emotions and they identify quite strongly with the leader. As a result of such identification with the leader, the leader develops the ability to transform followers. The transformational leader can transform followers by helping them become more aware of the importance of task outcomes; inducing them to transcend their own individual interest for the sake of the group or organization; activating their higher-order needs. Bass claimed that charisma is an important ingredient of transformational leadership but is not the only factor to account for the transformational process (Yukl, 1989). Transformational leaders tend to seek new ways of working, seek opportunities in the face of risk, and are less likely to support the status quo. They do not merely react to environmental circumstances, they attempt to shape and create them (Lowe *et al*., 1996).

Bass (1985) described a transactional leader as likely to operate within the existing system, to have a preference for risk avoidance, and to be attentive to time constraints and efficiency. This type of leader is likely to be effective in stable, predictable environments. The relationship between a leader and follower is characterized by an equitable leader-member exchange, where the leader fulfills the needs of the followers in exchange for their performance meeting basic expectations. The transactional leader does not individualise the needs of his/her followers and does not focus on their personal development. They are usually influential as it would be in the best interests of the followers to do what the leader wants (Bass, 1985; Lowe *et al*., 1996; Northouse, 2004). Transactional leadership is described as an exchange that takes place among leaders, colleagues and followers. The leader discusses with his/her subordinates what is required from them and explains the conditions and rewards they would receive if they fulfill those requirements (Bass & Avolio, 1994; Lowe *et al*., 1996).

Bass (1985) viewed the transformational and transactional leadership paradigm as being complementary rather than polar constructs although this stance is not always readily apparent in the manner the two concepts are presented. Both leadership competencies are required for the achievement of goals and objectives. The transformational leadership competency is complementary to the transactional competency, in the sense that transformational leadership would be ineffective without a transactional relationship between a leader and a subordinate. Therefore, a successful leader needs to be both transformational and transactional. Thus, transformational leadership augments transactional leadership to achieve higher levels of subordinate performance, the difference being in the process through which the leader motivates subordinates and the type of goals that are set to be achieved (Lowe *et al*., 1996).

The manner in which Bass (1985) and Burns (1978) conceptualize transformational leadership have a number of aspects that are similar, however, there are also a number of differences. Burns (1978) limits transformational leadership to enlightened leaders who appeal to positive moral values and higher-order needs of followers. Bass (1985), in contrast, suggests that a transformational leader is one who activates follower motivation and increases follower commitment, regardless of whether the effects ultimately benefit followers. Both Bass (1985) and Burns (1978) view transactional leadership as an exchange process of rewards for follower compliance. However, Bass (1985) defined transactional leadership in broader terms than Burns (1978). The exchange process includes the use of incentives, contingent rewards, influence motivation as well as clarification of the work required to obtain rewards. Bass considered transactional and transformational leadership as distinct but not mutually exclusive processes, and that the same leader may use both types of leadership at different times in different situations (Yukl, 1989). Whereas Burns (1978) conceived the two types of leadership as opposite ends of a continuum, Bass (1985) views them as separate dimensions. Therefore, according to Bass a leader can be both transactional and transformational (Bryman, 1992). The LBI seems to hold the even stronger opinion that to be effective a leader *should* be both transactional and transformational. Further, Burns adopted more of a broad-brush account, whereas Bass seeks to outline the components of the two types of leadership, and is concerned to specify their content more precisely (Bryman, 1992).

An explanation of the dynamics of the transformation process is provided in Bass's model of transformational and transactional leadership (Bass, 1985). This model incorporates seven different factors and these factors are illustrated in the full range leadership model, which is depicted in Table 2 below. A discussion of these factors will be provided to help clarify Bass's model. This discussion will present transformational leadership, transactional leadership and laissez-faire leadership as distinct higher-order leadership dimensions and will explicate the narrower first-order within each secondary leadership factor. The components of the transformational leadership model have evolved somewhat since Bass's original 1985 publication, however, the changes have been relatively minor (Conger, 1999; Northouse, 2004).

TABLE 2

FULL RANGE LEADERSHIP MODEL

Transformational leadership	Transactional leadership	Laissez-faire leadership
Factor 1: Idealized influence Charisma	**Factor 5:** Contingent reward Constructive transactions	**Factor 7:** Laissez-faire Non-transactional
Factor 2: Inspirational Motivation	**Factor 6:** Management-by-exception, Active and passive Corrective transactions	
Factor 3: Intellectual stimulation		
Factor 4: Individualized consideration		

(Conger, 1999; Northouse, 2004)

2.5 TRANSFORMATIONAL LEADERSHIP FACTORS

2.5.1 Idealized Influence (also called charisma)

Bass (1985) described the leaders as behaving in ways that result in being seen as role models for their followers. The leaders are admired, respected, and trusted. Followers generally identify quite strongly with the leader and want to emulate them (Bass, Avolio, Jung & Berson, 2003). They provide a vision and a sense of mission, which, when it is effectively articulated, instills pride, gains respect and trust and increases optimism (Bryman, 1992; Den Hartog, van Muijen, Koopman, 1997; Lowe *et al*., 1996; Northouse, 2004). These leaders usually have very high standards of moral and ethical conduct and are consistent in conduct with underlying ethics, principles and values (Bass, Avolio, Jung & Berson, 2003; Northouse, 2004). Charisma is considered by many (Conger and Kanungo, 1988; Waldman, Bass and Yammarino, 1990) as being the most critical behaviour in the transformational leadership model (Humphreys, 2001).

2.5.2 Inspirational Motivation

Leaders behave in ways that motivate their subordinates by providing meaning and challenge to their work. They usually communicate high expectations to their followers, inspiring them through motivation to become committed to and be part of the vision. Bass (1985) sees inspiration as 'a subfactor within charismatic leadership.' He suggests that charismatic leadership clearly inspires, in that it arouses and incites, but that inspiration can occur without charismatic leadership (Bryman, 1992).

2.5.3 Intellectual stimulation

Leaders stimulate followers' effort to be innovative and creative by questioning assumptions, by approaching old situations in new ways, and rethinking of the ways in which things were done in the past (Bass, Avolio, Jung & Berson, 2003; Den Hartog, van Muijen & Koopman, 1997; Northouse, 2004). The leader also provides followers with support as they test the new approaches (Humphreys, 2001; Northouse, 2004). They promote followers' thinking things out on their own and engaging in careful problem solving (Doherty, 1997; Northouse, 2004).

2.5.4 Individualised Consideration

Leaders provide a supportive climate by listening carefully to the individual needs of their followers while acting as a coach or mentor (Bass, 1985; Den Hartog, van Muijen, Koopman, 1997; Humphreys, 2001; Northouse, 2004). New learning opportunities are created along with a supportive environment in which followers can grow to their fullest potential (Bass, Avolio, Jung, Berson, 2003; Den Hartog, van Muijen, Koopman, 1997) The leader may use delegation as opportunities for growth and to stimulate learning experiences (Northouse, 2004).

2.6 TRANSACTIONAL LEADERSHIP FACTORS

2.6.1 Contingent reward

The leader clarifies expectations and offers recognition when goals are achieved (Bass, Avolio, Jung, Berson, 2003; Den Hartog, van Muijen, Koopman, 1997). This refers to an exchange process between leaders and followers in which effort by followers is exchanged for specified rewards (Northouse, 2004; Tejeda, Scandura, Pillai, 2001) Rewards are provided in exchange for follower compliance with their leader demands. Thus, the rewards are conditional upon followers' behaviour (Lowe *et al*., 1996; Tejeda, Scandura, Pillai, 2001).

2.6.2 Management-by-exception

This refers to leadership that involves corrective criticism, negative feedback and negative reinforcement. This usually takes two forms, namely, active management-by-exception and passive management-by-exception (Northouse, 2004). During active management-by-exception the leader closely monitors follower's performance for mistakes or rule violations and then takes corrective action if the follower fails to meet the necessary standards (Bass, Avolio, Jung & Berson, 2003; Den Hartog, van Muijen & Koopman, 1997; Tejeda, Scandura, Pillai, 2001). A leader using passive management-by-exception waits for problems to arise and only takes action when the necessary standards have not been met. (Bass, Avolio, Jung & Berson, 2003; Northouse, 2004).

2.6.3 Laissez-faire leadership

This represents the absence of leadership, thus, it is the complete avoidance of leading. The leader abdicates his/her responsibilities as a leader, does not make decisions, gives no feedback to subordinates, and there is no attempt to help followers to grow (Northouse, 2004; Den Hartog, van Muijen & Koopman, 1997; Humphreys, 2001).

2.7 THE MULTIFACTOR LEADERSHIP QUESTIONNAIRE

Bass (1985) developed an instrument to measure transactional and transformational leader behaviour. This instrument would also be used to investigate the nature of the relationship between these leader behaviours, and other relevant variables hypothesized to be affected by the quality of leadership like work unit effectiveness and follower satisfaction. The instrument, named as the Multifactor Leadership Questionnaire (MLQ) was conceptually developed and empirically validated to reflect the complementary dimensions of transformational and transactional leadership with subscales to further differentiate leader behaviour. Research on Multifactor Leadership Theory has been conducted using the MLQ as the primary measurement tool (Lowe *et al*., 1996; Northouse, 2004; Yukl, 1999). Yukl noted (1994, p. 353) “most of the research on the theory has involved the use of a questionnaire called the Multifactor Leadership Questionnaire (MLQ) to measure various aspects of transformational and transactional leadership.”

The conceptual basis for the original factor structure for the MLQ started with the description of transforming leadership developed by Burns (1978). About 70 executives were interviewed by Bass and his associates in South Africa. The executives were asked to think of leaders within their experiences who had raised their awareness to broader goals, moved them to higher motives, or inspired them to put others’ interests ahead of their own. The executives were then asked to describe how these leaders behaved, thus what they did to effect change. Added to this were items from prior literature on charisma. Based on these descriptions, Bass constructed the questions that made up the MLQ. The original 142 items that were generated were sorted by 11 judges into transformational and transactional contingent reward leadership categories. The final set of 73 items were administered to 176 senior US Army Officers who were asked to describe their superiors. Emerging from this analyses were three transformational factors – charismatic leadership (including inspirational leadership), individual consideration, and intellectual stimulation; and two transactional factors – contingent reward and management-by-exception (Bass, 1985; Lowe et al., 1996; Northouse, 2004). In the early research undertaken on the MLQ, inspirational leadership was subsumed under charismatic leadership as there was difficulty disentangling it. Moreover, there was not a measure of laissez-faire leadership, no distinction was made between contingent promises and rewards, as well as the active and passive forms of management-by-exception were not distinguished (Bryman, 1992).

When reviewing the literature on the Multifactor Leadership Theory (MLT) it becomes clear that there are quite a number of different measures of MLT constructs. Although most research has used the MLQ, some of the studies have developed new measures, employed modifications of the MLQ, or used various forms of the MLQ itself (Tejeda, Scandura & Pillai, 2001). The MLQ has undergone a number of revisions and there are slightly different versions to reflect the special characteristics of the organizations from which the various samples of leaders have been taken. It continues to be redefined to strengthen its reliability and validity. The MLQ has since undergone quite a bit of research as the primary quantitative instrument to measure the transformational leadership construct (Bryman, 1992; Lowe et al., 1996; Northouse, 2004). Different behaviours are involved in transformational and transactional leadership. The behaviours are measured with the MLQ, which is administered to subordinates/followers that measure their perceptions of how frequently their leader uses each type of behaviour. The MLQ is made up of a number of questions that measure followers' perceptions of a leader's behaviour which is based on the seven factors in the transformational and transactional leadership model as well as items that measure extra effort, effectiveness and satisfaction. The content of the MLQ has varied somewhat over time and additional transformational and transactional behaviours have been added to the recent versions (Northouse, 2004; Yukl, 1999). The following transformational and transactional components have been identified by the MLQ: idealized influence, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, management-by-exception (active), management-by-exception (passive) as well as laissez-faire (Northouse, 2004; Warr, 2002).

Most of the survey studies using the MLQ and similar questionnaires found that transformational leadership is positively related to indicators of leadership effectiveness such as subordinate satisfaction, motivation and performance. In a meta-analytical review of 39 studies which used the MLQ, Lowe, Kroeck and Sivasubramaniam (1996) found that key elements of transformational leadership correlated positively with subordinate satisfaction and performance. Contingent reward, which is a transactional behaviour also correlated positively with the criteria, although the results were weaker and less consistent. Transformational leadership was found to be effective in a variety of different situations using descriptive studies based on interviews and observations (Yukl, 1999).

Most factor analytical studies have supported the distinction between transformational and transactional behaviour, however, a number of discrepancies have been found. Certain studies have found that positive reward behaviour loads on the transformational factor instead of the transactional factor. Some studies also found that laissez-faire leadership and passive management-by-exception actually form a separate factor rather than loading on transactional leadership (Yukl, 1999).

2.8 THE FACTOR STRUCTURE OF THE MULTIFACTOR LEADERSHIP QUESTIONNAIRE

The factor structure of a 24-item (reduced) version of Bass and Avolio's (1990) 72-item MLQ was examined by Tepper and Percy (1994). They employed confirmatory factor analysis (CFA) to examine the hypothesized structure of the MLQ using a reduced set of items from the MLQ Form X. Tepper and Percy found that none of the hypothesized models could be confirmed. In subsequent exploratory analyses, they found that the charismatic and inspirational leadership scales converged to a single construct and that the management-by-exception scales may require improvement or reinterpretation as a result of their relationship to the contingent reward scale.

Bycio, Hackett and Allen (1995) conducted confirmatory factor analysis using the original five-factor model hypothesized by Bass (1985). This study used all the transformational and transactional MLQ items. They used the earliest available version of the MLQ with only transformational and transactional items and an earlier version of the Multifactor Leadership theory. Support was found for the basic hypotheses of Multifactor Leadership theory, however, there were high proportions of error variance in the transactional scales and high intercorrelations among the transformational scales. Bycio *et al*. (1995) raised the issue that there remains unresolved psychometric issues with the MLQ, specifically the first-order factor structure.

A study done by Tejeda, Scandura and Pillai (2001) hypothesesed that there would be high intercorrelations among the subscales of the MLQ (Form 5X) and that confirmatory factor analysis would reveal poor model fit for the first-order hypothesized structure. This was supported and this has significant implications for the MLQ. Their study does not lend support to the continued use of the full-item MLQ. They, therefore, proposed a 27-item reduced version of the MLQ. Tejeda *et al*. (2001) was able to demonstrate in independent data sets that the transformational and transactional scales of the 27-item version were internally consistent in all their samples. The proposed 27-item reduced version of the MLQ seems to be a reasonable representation of Bass and Avolio (1993) first- and second-order structures of the full-item set of the MLQ.

During the past fifteen years, there have been many leadership studies that have used some form of the MLQ. However, the validity of the MLQ has not been fully established. In certain versions of the MLQ, the four factors of transformational leadership (idealized influence, inspirational motivation, intellectual stimulation and individualized consideration) have been found to correlate very high with each other, which suggest that they are not distinct factors. Further, some of the transformational factors also correlate with the transactional and laissez-faire factors, which suggest that they are not unique to the transformational model. As a result of these findings serious questions are raised of the MLQ and about the clarity of the transformational leadership model. However, the new, improved 27-item version of the MLQ that has been developed holds promise for validating the legitimacy of the theory (Northouse, 2004).

After Bass's (1985,1988) proposal of a six-factor model of transactional and transformational leadership, many theorists (Bass, 1985, 1990); Bass & Avolio, 1990, 1993, 1994; Bryman, 1992; Bycio, Hackett & Allen, 1995; Den Hartog, Van Muijen & Koopman, 1997; House & Podsakoff, 1994; Hunt, 1991; Waldman, Bass & Einstein, 1987; Yammarino & Bass, 1990; Yukl, 1994) have offered recommendations, analyses, reviews and critiques to modify the components in this model. These modifications arose because many theorists could not replicate the six-factor model that was introduced by Bass (1985). Consequently, recommendations were made to collapse certain of the original leadership factors into higher-order factors such as transformational leadership.

Subsequent to the six-factor model reported by Bass (1985), a number of analyses looking at the various forms of the MLQ appeared in the literature. Many authors raised concerns about whether the components of transformational leadership should be considered independent of contingent reward leadership, and/or whether contingent reward leadership should be seen as a separate factor. Further, many authors highlighted that the components of transformational leadership could not be distinguished empirically. Hater and Bass (1988) indicated that management-by-exception could be divided into two sub-factors, that is, active versus passive. However, recent results indicated that passive management-by-exception and laissez-faire leadership should be formed into a single higher-order factor. Den Hartog *et al*. (1997) indicated that there was a correlation between ratings of laissez-faire leadership and passive management-by-exception, and that these scales correlated negatively with all the other scales in the MLQ.

Avolio, Bass and Jung (1999) set out to test the six-factor model of Bass (1985) in a broader and more diverse sample of respondents. They aimed to examine whether a revised version of the MLQ (Form 5X) would produce a more stable and replicable factor structure. The Form 5X version of the MLQ was designed to address certain of the limitations of the earlier versions of the MLQ. The six first-order factors measured by the MLQ (Form 5X) are: charisma/inspirational, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive-avoidant leadership.

In the above study the authors constructed a passive-avoidant leadership factor which contains both sets of items from the laissez-faire and passive management-by-exception scale. Avolio *et al*. (1999) used as its primary base target the six-factor model proposed by Bass (1985) to test eight alternative first-order measurement models. The best model fit was the original six-factor model which held up with relatively little shrinkage in terms of its fit when tested against the competing measurement models.

In an effort to address the problem of a lack of discriminant validity among the six first-order scales as indicated by high correlations amongst the scales, Avolio *et al*. (1999) tested three hierarchical models. The models are as follows:

- Model one: In addition to the six first-order factors were two uncorrelated second-order factors, including, active constructive (charisma/inspirational, intellectual stimulation, individualized consideration and contingent reward) and passive corrective (management-by-exception and laissez-faire) leadership.
- Model two: This model included three uncorrelated second-order factors, including, transformational (charismatic/inspirational and intellectual stimulation), developmental/transactional (individualized consideration and contingent reward) and passive corrective (management-by-exception and laissez-faire) leadership.
- Model three: This model contained two correlated second-order factors, including transformational leadership (charismatic/inspiration, intellectual stimulation), developmental/transactional (individualized consideration and contingent reward) and a third uncorrelated corrective avoidant factor (management-by-exception and laissez-faire) leadership.

The model found to fit the best was model three which contained two correlated second-order factors and a third uncorrelated factor to the six first-order factors.

2.9 A SECOND-ORDER FACTOR STRUCTURE FOR THE LBI BASED ON THE MLQ SECOND-ORDER FACTORS

The results of the Avolio *et al*. (1999) research study indicated that the factor structure for the MLQ survey was best represented by six first-order factors and three correlated second-order factors. By including two second-order factors to represent the transformational and transactional leadership factors, Avolio *et a*l. (1999) was able to reduce the latent correlations and enhance the discriminant validity between the transformational second-order factor containing charisma, inspirational and intellectual stimulating leadership and the transactional second-order factor containing individualized consideration and contingent reward. Could the second-order structure isolated by Avolio *et al*. (1999) be adapted to explain the correlations observed between the first-order factors of the LBI?

An inspection of the latent correlations indicated there was a distinct second-order transformational factor that correlated with a developmental/transactional factor. The results further indicated that a passive corrective second-order factor was clearly distinguishable from the other two second-order factors. The intercorrelations among each of the second-order factors also provided further evidence for discriminant validity (Avolio *et al*., 1999).

The positive correlations between the transformational and transactional leadership scales can be expected for a number of reasons. Firstly, both transformational and transactional leadership represent active and constructive forms of leadership. Secondly, effective leaders would display varying amounts of both transactional and transformational leadership (Avolio & Bass, 1995; Bass & Avolio, 1993, 1994). Thirdly, by consistently fulfilling agreements, it provides conditions for building trust and dependability which could contribute to the high levels of trust and respect associated with transformational leadership (Shamir, 1995). Therefore, although conceptually unique it is reasonable to obtain a positive correlation among these factors. Active management-by-exception also positively correlated with passive management-by-exception and passive avoidance, which is consistent with previous studies (Bass & Avolio, 1990, 1993) using earlier forms of the MLQ. Lastly, the passive-avoidance factor correlated negatively with the transformational and transactional leadership scales.

By using the transformational and transactional leadership factors proposed by Avolio *et al.* (1999) as a second-order factor structure it could assist in explaining the correlations between the first-order LBI latent leadership variables. However, the corrective avoidant factor seems unlikely to constitute a common theme shared by a number of first-order latent leadership variables (Theron & Spangenberg, 2005).

As indicated earlier, House (1995) provided a description of leadership which comprised three elements, namely, general leadership, which entails providing purpose, meaning and guidance to followers, articulating and implementing a compelling vision; management, which implies a position of formal authority that results in compliance of organizational members; supervisory leadership entails giving guidance, support and corrective feedback to followers on a day-to-day basis. The LBI encompasses elements of all three definitions and the various first-order dimensions could meaningfully be categorized under House's (1995) description of leadership (Theron & Spangenberg, 2005). Table 3 depicts the manner in which Theron and Spangenberg (2005) proposed that the twenty-four first-order LBI leadership dimensions should load on the leadership factors distinguished by House (1995). By proposing this linkage between the first-order LBI dimensions and House's (1995) three elements of leadership, Theron and Spangenberg (2005) thereby also provided a useful framework that can assist when constructing a second-order factor structure based on the Avolio *et al*. (1999) best fitting second-order factor model. This seems a reasonable contention because it does not seem unreasonable to argue that House's (1995) dimensions of general leadership, management and supervisory leadership can be conceptually linked to transformational and transactional leadership. General leadership falls within the realm of charismatic or transformational leadership, and management and supervisory leadership ensure that employees meet work requirements, and provide support and work-related feedback which can be linked to transactional leadership (Theron & Spangenberg, 2005).

TABLE 3
HOUSE'S (1995) DIMENSIONS OF LEADERSHIP AND THE CORRESPONDING LBI DIMENSIONS

General Leadership	**Supervisory Leadership**	**Management Behaviours**
These leader behaviours theoretically influence the values, motives and self-concepts of followers. House (1995) listed these behaviours as there is substantial evidence of their effectiveness from empirical research or historical sources.	*These behaviours involve monitoring, guiding and providing corrective feedback to followers on a day-to-day basis.*	*These behaviours are rational-analytic and are concerned with the developmental and implementation of organizational strategies, tactics, and policies. Examples include planning, organizing and establishing administrative systems.*
Developing challenging vision (Visi) Building trust (Trus) Empowering followers (Foll) Honesty & integrity (Hono) Decisiveness & hardiness (Deci) Inspiring people (Insp) Acting entrepreneurial (Acti) Articulating vision & enlisting followers (Arti) Enabling the leader: personal growth (Risk) Enabling the leader: self-	Empowering followers (Foll) Building culture (Cult) Interpersonal skills (Mana) Showing concern for others (Trea) Inspiring people (Insp) Developing & implementing performance plans (Plan) Rewarding performance (Rewa) Facilitating learning (Lear) Facilitating interdepartmental co-ordination (Coor)	Awareness external environment (Awex) Awareness internal environment (Awin) Conceptualising strategy (Stra) Optimising structures & systems (Syst) Challenging current reality (Valu) Developing & implementing performance plans (Plan) Reviewing performance (Revi) Rewarding performance (Rewa)

discovery & -management (Lead) Influencing the external environment (Infl)		

In terms of the foregoing argument it seems reasonable to contend that all the first-order LBI factors loading on the management and supervisory leadership factors in Table 3 could be combined under the transactional leadership factor. The general leadership factor could in turn be equated to the transformational second-order factor (Theron & Spangenberg, 2005).

A concern raised by Theron and Spangenberg (2005) regarding a possible second-order structure based on the House (1995) conceptualization of leadership is that a number of LBI first-order factors could load on more than one second-order factor. It could be argued, for example, that the first-order factors of empowerment of followers and inspiring others should load both on supervisory leadership and general leadership. This implies that there are complex primary factors which load on more than one second-order factor. This could possibly be an unavoidable expression of the complex, intricate nature of leadership behaviour (Theron & Spangenberg, 2005). In the second-order factor model based on House (1995) this is, however, also partly due to the conceptual overlap between general and supervisory leadership. However, the second-order factor structure based on Avolio *et al*. (1999) and depicted in Table 4 seems to reduce the likelihood of cross loadings somewhat because of the more mutually exclusive conceptual interpretation of the two second-order factors. Despite being conceptually distinct it nonetheless seems reasonable to postulate a moderate correlation between the two second-order factors. Moreover, the second-order factor structure depicted in Table 4 seems to be sufficiently plausible to justify its empirical evaluation.

TABLE 4
A SECOND-ORDER FACTOR MODEL BASED ON AVOLIO et al. (1999)

Transformational	Transactional
Developing challenging vision (Visi)	Empowering followers (Foll)
Building trust (Trus)	Building culture (Cult)
Empowering followers (Foll)	Interpersonal skills (Mana)
Honesty & integrity (Hono)	Showing concern for others (Trea)
Decisiveness & hardiness (Deci)	Developing & implementing performance plans (Plan)
Inspiring people (Insp)	Facilitating learning (Lear)
Acting entrepreneurial (Acti)	Facilitating interdepartmental co-ordination (Coor)
Articulating vision & enlisting followers (Arti)	Awareness external environment (Awex)
Enabling the leader: personal growth (Risk)	Awareness internal environment (Awin)
Enabling the leader: self-discovery & management (Lead)	Conceptualising strategy (Stra)
Influencing the external environment (Infl)	Optimising structures & systems (Syst)
	Challenging current reality (Value)
	Reviewing performance (Revi)
	Rewarding performance (Rewa)
	Influencing the external environment (Infl)

CHAPTER 3

RESEARCH METHODOLOGY AND PREPARATORY DATA ANALYSIS

3.1 RESEARCH HYPOTHESIS AND MEASUREMENT MODEL

The second-order factor structure based on the Avolio *et al*. (1999) best fitting second-order factor model will be examined as it seems to offer a plausible explanation for the covariance observed between the LBI first-order factors. This model seems to offer a convincing explanation for the correlations existing between the LBI primary factors and therefore it warrants an empirical evaluation.

The substantive research hypothesis is therefore that the proposed second-order measurement model closely fits the data and that all freed parameters in the model are non-redundant. The proposed second-order measurement model is illustrated in Figure 1.

3.2 SAMPLE

The data utilized in this study was obtained from the previous study done by Theron and Spangenberg (2005). They acquired the data from the LBI database of the Centre of Leadership Studies of the Graduate School of Business of the University of Stellenbosch. This database resulted from a number of non-probability samples of unit managers that were selected from various organizations in the financial sector.

According to Theron and Spangenberg (2005) unit leaders were rated by their superiors, peers and subordinates. At the time of the analysis, 1838 completed LBI questionnaires were available. Initially, their objective was to obtain ratings from two subordinates, two peers, and a single superior, however, the need for a large sample size, together with the difficulties encountered when attempting to apply a questionnaire of the LBI's length to respondents on such a high level, necessitated a deviation from their objective in a number of cases.

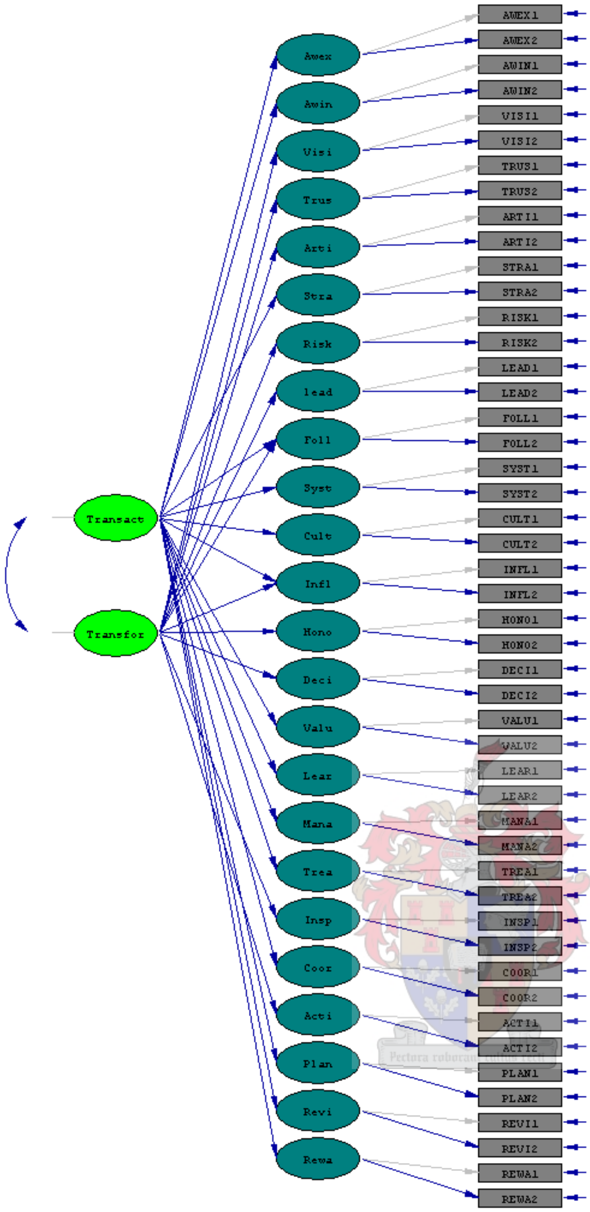

FIGURE 1. THE PROPOSED SECOND-ORDER FACTOR STRUCTURE FOR THE LBI BASED ON THE AVOLIO *ET AL.* (1999) BEST FITTING SECOND-ORDER FACTOR MODEL

3.3 MISSING VALUES

Theron and Spangenberg (2005) had to deal with the problem of missing values before the analysis could proceed. They evaluated a number of different alternatives to deal with this problem and finally identified which alternative would be best suited.

An alternative that was considered by Theron and Spangenberg (2005) was list-wise deletion of cases. The list-wise method is useful if the proportion of missing data is not too great. A drawback is that it may seriously reduce sample size (Hair, Anderson, Tatham & Black, 1998). This alternative was thus eliminated by Theron and Spangenberg (2005), as it would have dramatically reduced the sample size to 969. This was a result of the extent of the problem and the length of the questionnaire. They concluded that by using this alternative half the sample would had to have been sacrificed, which could have introduced sampling bias. Replacing the missing values with items means was another alternative that was explored. Theron and Spangenberg (2005) claimed that this approach would wash out most of the structure that existed in the data and was thus not advisable to use. Another solution that would have been less that ideal was pair-wise deleting of cases. This approach could introduce irregularities into the data matrix that later could cause serious problems in the estimation process (Hair *et a*l., 1998). It would have resulted in a correlation matrix with extreme variation in N-values (a maximum of 1822 and a minimum of 1439 in this particular case). Theron and Spangenberg (2005) concluded that the best alternative would be the use of multiple imputation procedure. Their argument was that the advantage of both the two multiple imputation procedures available in LISREL 8.54 is that estimates of missing values are derived for all the cases in the initial sample, that is, no cases with missing values are deleted. Further, the item and dimensionality analyses and the formation of item parcels are available. The multiple imputation procedures available in LISREL 8.54, however, assume that the values are missing at random and that the observed variables are continuous and follow a multivariate normal distribution. The individual LBI items, on the other hand, should be viewed as ordinal in nature due to the five point Likert scale on which responses were indicated and would probably violate the multivariate normality assumption. Consequently Theron and Spangenberg (2005) considered it more prudent not to use the multiple imputation option but rather settle for a more conservative imputation by matching procedure.

Imputation by matching is a process of substituting real values for missing values (Jöreskog and Sörbom, 1996b). The substitute values are obtained from one or more other cases that have a similar response pattern over a set of matching variables. The items least plagued by missing values were firstly identified. A set of 10 variables with 30 or less missing values per variable was subsequently defined to serve as matching variables. Theron and Spangenberg (2005) used the PRELIS programme (Jöreskog & Sörbom, 1996b) to impute the missing values. The cases with missing values after imputation are eliminated. Once imputation was completed 1586 cases with observations on all 96 items remained in the sample (Theron & Spangenberg, 2005).

3.4 DIMENSIONALITY ANALYSIS

According to Theron and Spangenberg (2005) the structure of the LBI reflects the intention to construct essentially one-dimensional set of items to reflect variance in each of the 24 latent variables collectively comprising the leadership domain. The items of the LBI are meant to function as homogeneous stimulus sets to which raters respond with behaviour that is primarily a relatively uncontaminated expression of a specific single underlying latent variable.

Dimensionality analysis was explored as the unidimensionality of the sub-scales had to be confirmed so as to justify the calculation of item parcels. Unidimensionality analysis is necessary as it allows us the opportunity to determine if the items are strongly associated with each other and represent a single concept as the developers of the instrument intended (Hair, Anderson, Tatham & Black, 1998). Further, by using dimensionality analysis it would enable the identification and removal of items with inadequate factor loadings and/or the splitting of heterogeneous sub-scales into two or more homogenous subsets of items if that is necessary.

Principal component analysis with Varimax rotation was performed on each of the 24 LBI subscales. The eigenvalue-greater-than unity rule of thumb was used to determine the number of factors to extract. All 24 subscales passed the uni-dimensionality test. The results of the dimensionality analyses are summarized in Table 5.

TABLE 5
PRINCIPLE COMPONENT ANALYSES OF LBI SUB-SCALE MEASURES

Scale	KMO	% Variance Explained	Max λ	Min λ	Residual r > 0.05
Awex	0,75	62,32	0,802	0,767	66
Awin	0,79	62,86	0,833	0,750	100

Visi	0,80	64,44	0,848	0,769	100
Trus	0,81	66,15	0,836	0,777	100
Arti	0,82	71,31	0,880	0,812	83
Stra	0,79	63,42	0,818	0,778	100
Risk	0,75	58,39	0,794	0,704	100
Lead	0,76	57,79	0,815	0,625	100
Foll	0,79	62,15	0,812	0,741	100
Syst	0,79	63,91	0,816	0,785	100
Cult	0,78	61,11	0,828	0,742	100
Infl	0,75	60,56	0,838	0,710	83
Hono	0,79	61,24	0,803	0,766	100
Deci	0,78	63,36	0,819	0,747	100
Valu	0,74	55,83	0,822	0,700	100
Lear	0,79	62,12	0,829	0,755	100
Mana	0,79	66,49	0,846	0,791	83
Trea	0,81	67,89	0,849	0,803	100
Insp	0,82	71,56	0,880	0,782	83
Coor	0,81	67,39	0,837	0,803	100
Acti	0,76	59,76	0,840	0,678	100
Plan	0,81	67,87	0,848	0,751	100
Revi	0,82	70,51	0,880	0,808	100
Rewa	0,82	72,87	0,890	0,804	100

3.5 ITEM ANALYSIS

Each of the 24 LBI sub-scales were item analysed through the SPSS Reliability Procedure (SPSS, 1990). The aim of this was to identify and eliminate items not contributing to an internally consistent description of the leadership facet in question. The summary results of the item analysis are shown in Table 6. Ten of the subscales in the analysis had Cronbach alpha values less than 0,80 but greater than 0,74. The degree of item homogeneity found for each of the subscales, which are indicated by the Cronbach values in Table 6 are acceptable but not altogether satisfactory. The results of the dimensionality and item analyses did indicate that the items that comprise the various scales reflects a similar underlying construct. Therefore, it can be tentatively assumed that the various scales reflect the intended latent variables. To generate stronger support for this claim would require expanding the respective measurement models into fully fledged theory driven structural models and confronting these with the current dataset via a series of confirmatory model fitting analyses using LISREL (Theron & Spangenberg, 2005).

TABLE 6
RELIABILITY OF LBI SUB-SCALE MEASURES
Sample after imputation
(n=1586)

Scale	Alpha	Mean	Variance
Awex	0,794	16,24	7,41
Awin	0,801	15,77	7,21
Visi	0,815	15,79	8,08
Trus	0,828	16,42	8,01
Arti	0,865	15,54	9,26
Stra	0,806	15,98	7,49
Risk	0,757	16,13	7,52
Lead	0,751	16,03	7,57
Foll	0,796	15,51	7,72
Syst	0,811	15,73	7,58
Cult	0,786	16,51	7,38
Infl	0,781	16,70	6,64
Hono	0,788	16,44	6,65
Deci	0,806	16,43	7,73
Valu	0,745	16,06	6,59
Lear	0,795	15,69	7,90
Mana	0,832	15,61	8,93
Trea	0,842	16,07	8,17
Insp	0,867	15,75	8,84
Coor	0,838	15,89	9,17
Acti	0,766	15,94	7,38
Plan	0,840	16,36	7,39
Revi	0,860	15,93	9,19
Rewa	0,875	16,08	9,75

3.6 VARIABLE TYPE

Theron and Spangenberg (2005) suggested that because the LBI uses a five-point Likert scale to capture responses, the individual LBI items should be treated as ordinal variables. According to them structural equation modeling on the LBI in which each individual item serves as a manifest or indicator variable of the various latent leadership facets would, however, have resulted in an extremely cumbersome and extensive exercise simply due to the number of items involved. Moreover, as a result of the ordinal nature of the data, the calculation of an asymptotic covariance matrix or an asymptotic variance matrix would have been required. This would have demanded quite large amounts of memory especially when the number of variables is so many (Jöreskog & Sörbom, 1996a). Consequently, two manifest variables were created from each sub-scale. This was done by calculating the unweighed average of the odd-numbered items and the even numbered items of each scale. Parceling was decided because if the individual items were treated as indicator variables the consequence would have been a very unwieldy comprehensive LISREL model. The composite indicator variables were treated as continuous variables. Therefore the analysis of the covariance matrix was required instead of the polychoric correlation matrix (Theron & Spangenberg, 2005).

3.7 UNIVARIATE AND MULTIVARIATE NORMALITY

PRELIS was used to evaluate the univariate and multivariate normality of the composite indicator variables. The null hypothesis of univariate normality had to be rejected for all 48 composite indicator variables. Table 7 provides the results for the test of multivariate normality for continuous variables. The assumption of multivariate normality is therefore not tenable.

TABLE 7
TEST OF MULTIVARIATE NORMALITY FOR CONTINUOUS VARIABLES

Skewness			Kurtosis			Skewness & Kurtosis	
Value	Z-score	P-Value	Value	Z-Score	P-Value	Chi-Square	P-Value
175,29	98,644	0,000	3048,69	60,242	0,000	13359,639	0,000

However, the default method of estimation when fitting measurement models to continuous data requires multivariate normality. Multivariate normality is also required for the generalized least squares (GLS) and full information maximum likelihood (FIML) methods for structural equation modeling. The inappropriate analysis of continuous non-normal variables in structural equation models can result in incorrect standard errors and chi-square estimates (Du Toit & Du Toit, 2001; Mels, 2003).

Two solutions to deal with this lack of normality were investigated by Theron and Spangenberg (2005). The first solution investigated attempted to normalize the composite indicator variables. The PRELIS normalization resulted in improving the symmetry and kurtosis of the individual indicator variable distributions, however, the null hypothesis of multivariate normality had to be rejected again. Table 8 provides a summary of the results. The failure of the normalization to salvage the lack of multivariate normality is due to the fact that normalizing occurs for each variable separately.

TABLE 8
TEST OF MULTIVARIATE NORMALITY FOR CONTINUOUS VARIABLES

Skewness			**Kurtosis**			**Skewness & Kurtosis**	
Value	Z-score	P-Value	Value	Z-Score	P-Value	Chi-Square	P-Value
120,74	52,416	0,000	2768,965	47,226	0,000	4977,740	0,000

An alternative method of estimation was thus considered since the normalization option did not have the desired effect. An approach was considered that would be more suited to data not following a multivariate normal distribution. This approach has the advantage over the use of normal scores that the solution need not be interpreted in terms of transformed scores. Weighted least squares (WLS), diagonally weighed squares (DWLS) and robust maximum likelihood (RML) are suggested to fit structural equation models to non-normal data (Du Toit & Du Toit, 2001; Jöreskog, Sörbom, Du Toit & Du Toit, 2000; Mels, 2003). Mels (2003) recommends the use of robust maximum likelihood estimation if the assumption of a multivariate normal distribution does not hold.

CHAPTER 4
EVALUATION OF THE FIRST AND SECOND-ORDER MEASUREMENT MODEL FIT

4.1 EVALUATION OF THE PRIMARY MEASUREMENT MODEL

Theron and Spangenberg (2005) had to make a decision whether to use a confirmatory (or possibly more appropriately termed, restricted) or an exploratory (or unrestricted) factor analytic approach, when evaluating whether the set of parceled LBI items represent the leadership latent variables. They decided to use a hypothesis testing, restricted, confirmatory factor analytic approach. The reasons they decided to adopt this approach are supported by the following argument. The LBI was developed to measure a specific multifaceted construct to which a specific constitutive meaning has been attached (which is based on the attributed internal structure of the construct and the manner in which it is assumed to be embedded in the nomological network of latent variables) as information on the defined construct is desired for decision-making. The information on the construct is useful for decision-making as it has been shown (or it is assumed) that this construct, with this specific constitutive definition, is related to some criterion considered relevant to the decision problem (Theron & Spangenberg, 2005). The constitutive meaning of the construct is thus not arbitrary and something that can be adapted to fit a specific collection of items compiled to measure the construct. Rather the constitutive meaning is fixed by the manner in which the construct is used in explanatory theoretical arguments explaining variance in the criterion variable of interest and the challenge is to create a set of items that will reflect the construct as constitutively defined.

Operational denotations are explicitly and intentionally identified that reflect specific facets of the construct. Utilizing such leadership denotations specific LBI items were written to function as homogenous stimulus sets to which raters would respond with behaviour which would be relatively uncontaminated behavioural expressions of specific latent leadership dimensions. Therefore, what needs to be made clear is to what extent this premeditated operational design did succeed in providing a comprehensive and uncontaminated empirical grasp of the construct with its predetermined constitutive definition. Theron and Spangenberg (2005) thus argued that to use a structure generating, unrestricted, exploratory approach in the evaluation of a measuring instrument born out of the foregoing argument would seem to be a logical contradiction and a denial of the underlying design intentions. Given the intention of the LBI to measure specific, a priori defined leadership competencies by means of a specific operational architecture, they moreover argued that a hypothesis testing, restricted, confirmatory approach should rather be used. Theron and Spangenberg (2005) consequently made specific structural assumptions with regard to the number of latent variables underlying the LBI, the relations among the latent variables and the specific pattern of loadings of indicator variables on these latent variables. If a measurement model reflecting these assumptions would fit the data obtained on the LBI poorly, Theron and Spangenberg (2005) acknowledged that they would have to revise the LBI rather than adapt the leadership construct to fit the current set of items.

Structural equation modeling (SEM) was used to perform a confirmatory first-order factor analysis on the dataset after imputation by matching of the missing values. As argued above the design and structure of the LBI implies a specific factor structure or measurement model. Two manifest variables were created from each of the twenty-four sub-scales by calculating the unweighted average of the odd numbered items and the even numbered items of each scale. The (first-order) measurement model underlying the LBI can therefore be expressed as equation 1.

$X = \Lambda_X\xi + \delta$ --1

where:

X is a 48x1 column vector of observable indicator variables, Λ_X is a 48x24 matrix of factor loadings, ξ is a 24x1 column vector of first-order latent leadership facets, and δ is a 48x1 column vector of unique/measurement error components comprising the combined effect on X of systematic non-relevant influences and random measurement error (Jöreskog & Sörbom, 1993).

The measurement model implies two additional matrices. A symmetric 24x24 covariance/correlation matrix Φ contains the correlations between the latent leadership competencies. All elements in the phi matrix were set free to be estimated thus expressing the constitutive conviction that the twenty-four latent leadership dimensions are correlated, albeit to varying degrees, amongst themselves. A diagonal 48x48 matrix θ_δ depicts the variance in the error terms associated with the indicator variables. The diagonal nature of the θ_δ matrix implies that the error terms δ are assumed to be uncorrelated across the indicator variables (Theron & Spangenberg, 2005). To assume correlated measurement error terms would imply common systematic error components amongst the error terms and/or causal effects between the systematic error terms. No theoretical justification exists for either assumption.

Lisrel 8.54 (Du Toit & Du Toit, 2001; Jöreskog *et al*., 2000) was used to perform a confirmatory first-order factor analysis on the LBI to determine the fit of the model expressed as equation 1. The imputed data was first read into PRELIS (Jöreskog and Sörbom, 1996b) to compute covariance and asymptotic covariance matrices to serve as input for the LISREL analysis. The model fit was evaluated through an analysis of a covariance matrix due to the assumed continuous nature of item parcels. As a result of the lack of multivariate normality in the data robust maximum likelihood estimation was used to estimate the parameters set free in the model. The latent variables contained in the model have no inherent scale as well as neither are the values expressed in a meaningful unit of measurement. In specifying the model the scales of measurement of the latent variables were not specified by setting the factor loadings on the first observed variable to unity. The latent variables were standardized rather than defining the origin and unit of the latent variable scales in terms of observable reference variables. Thus, the unit of measurement becomes the standard deviation. This option is preferable since the scale and origin of the observed variables are essentially arbitrary in any case, especially when dealing with ordinally scaled observed variables. All factor loadings of each latent leadership variable were set free to be estimated, but only with regard to its designated observed variables (Theron & Spangenberg, 2005). All remaining elements of Λ_X were fixed at zero loadings to reflect the assumed factorial simplicity of the LBI items (Tabachnick & Fidell, 1989). All the elements of Φ and the main diagonal of θ_δ were treated by default as free.

An admissible final solution of parameter estimates for the LBI first-order measurement model was obtained after 11 iterations. The Satorra-Bentler Scaled Chi-Square is 3750,57 which is significant ($p<0,01$). Therefore the null hypothesis of exact model fit was rejected. Nonetheless the remainder of the results indicated reasonably good model fit. The normed chi square χ^2/df (which equals 4,665) for the first-order measurement model suggest that the model fits the data reasonably well. The root mean square error of approximation (RMSEA) equals 0,048, which falls below the benchmark value of 0,05. The 90 percent confidence interval for RMSEA spans the interval 0,047; 0,050 which includes the critical cut-off value of 0,05. H_0: RMSEA $\leq$ 0,05 could not be rejected given that the p-value for the test of close fit (RMSEA < 0,05) equals 0,98. The root mean square residual (RMR) equals 0,018 and the standardized RMR 0,030 confirmed the foregoing interpretation. A standardized RMR of 0,05 and less is regarded as indicative of good fit (Diamantopoulos & Sigauw, 2000).

All indicator variables load significantly ($p < 0,05$) on the latent variables. The completely standardized loadings of the item parcels on the first-order leadership factors are shown in Table 9 below.

TABLE 9
COMPLETELY STANDARDIZED LOADINGS OF THE ITEM PARCELS ON THE FIRST-ORDER LEADERSHIP FACTORS

	AWEX	AWIN	VISI	TRUS	ARTI	STRA
AWEX1	0,83 (0,01) 42,08	- -	- -	- -	- -	- -
AWEX2	0,85 (0,01) 42,49	- -	- -	- -	- -	- -
AWIN1	- -	0,81 (0,01) 38,93	- -	- -	- -	- -
AWIN2	- -	0,84 (0,01) 42,62	- -	- -	- -	- -
VISI1	- -	- -	0,84 (0,02) 43,85	- -	- -	- -
VISI2	- -	- -	0,82 (0,02) 40,46	- -	- -	- -
TRUS1	- -	- -	- -	0,84 (0,02) 43,31	- -	- -
TRUS2	- -	- -	- -	0,82 (0,01) 41,48	- -	- -
ARTI1	- -	- -	- -	- -	0,87 (0,02) 46,19	- -
ARTI2	- -	- -	- -	- -	0,89 (0,01) 47,97	- -
STRA1	- -	- -	- -	- -	- -	0,83 (0,02) 41,60
STRA2	- -	- -	- -	- -	- -	0,84 (0,01) 41,94
RISK1	- -	- -	- -	- -	- -	- -
RISK2	- -	- -	- -	- -	- -	- -
LEAD1	- -	- -	- -	- -	- -	- -
LEAD2	- -	- -	- -	- -	- -	- -
FOLL1	- -	- -	- -	- -	- -	- -
FOLL2	- -	- -	- -	- -	- -	- -
SYST1	- -	- -	- -	- -	- -	- -
SYST2	- -	- -	- -	- -	- -	- -
CULT1	- -	- -	- -	- -	- -	- -
CULT2	- -	- -	- -	- -	- -	- -
INFL1	- -	- -	- -	- -	- -	- -
INFL2	- -	- -	- -	- -	- -	- -
HONO1	- -	- -	- -	- -	- -	- -
HONO2	- -	- -	- -	- -	- -	- -
DECI1	- -	- -	- -	- -	- -	- -
DECI2	- -	- -	- -	- -	- -	- -
VALU1	- -	- -	- -	- -	- -	- -
VALU2	- -	- -	- -	- -	- -	- -
LEAR1	- -	- -	- -	- -	- -	- -
LEAR2	- -	- -	- -	- -	- -	- -
MANA1	- -	- -	- -	- -	- -	- -
MANA2	- -	- -	- -	- -	- -	- -
TREA1	- -	- -	- -	- -	- -	- -
TREA2	- -	- -	- -	- -	- -	- -
INSP1	- -	- -	- -	- -	- -	- -
INSP2	- -	- -	- -	- -	- -	- -

COOR1	- -	- -	- -	- -	- -	- -
COOR2	- -	- -	- -	- -	- -	- -
ACTI1	- -	- -	- -	- -	- -	- -
ACTI2	- -	- -	- -	- -	- -	- -
PLAN1	- -	- -	- -	- -	- -	- -
PLAN2	- -	- -	- -	- -	- -	- -
REVI1	- -	- -	- -	- -	- -	- -
REVI2	- -	- -	- -	- -	- -	- -
REWA1	- -	- -	- -	- -	- -	- -
REWA2	- -	- -	- -	- -	- -	- -

	RISK	LEAD	FOLL	SYST	CULT	INFL
AWEX1	- -	- -	- -	- -	- -	- -
AWEX2	- -	- -	- -	- -	- -	- -
AWIN1	- -	- -	- -	- -	- -	- -
AWIN2	- -	- -	- -	- -	- -	- -
VISI1	- -	- -	- -	- -	- -	- -
VISI2	- -	- -	- -	- -	- -	- -
TRUS1	- -	- -	- -	- -	- -	- -
TRUS2	- -	- -	- -	- -	- -	- -
ARTI1	- -	- -	- -	- -	- -	- -
ARTI2	- -	- -	- -	- -	- -	- -
STRA1	- -	- -	- -	- -	- -	- -
STRA2	- -	- -	- -	- -	- -	- -
RISK1	0,68 (0,02) 30,45	- -	- -	- -	- -	- -
RISK2	0,82 (0,02) 37,73	- -	- -	- -	- -	- -
LEAD1	- -	0,75 (0,02) 33,86	- -	- -	- -	- -
LEAD2	- -	0,79 (0,02) 35,91	- -	- -	- -	- -
FOLL1	- -	- -	0,84 (0,02) 42,88	- -	- -	- -
FOLL2	- -	- -	0,79 (0,02) 37,07	- -	- -	- -
SYST1	- -	- -	- -	0,83 (0,01) 41,75	- -	- -
SYST2	- -	- -	- -	0,84 (0,01) 43,17	- -	- -
CULT1	- -	- -	- -	- -	0,80 (0,01) 40,38	- -
CULT2	- -	- -	- -	- -	0,81 (0,02) 40,48	- -
INFL1	- -	- -	- -	- -	- -	0,82 (0,01) 41,10
INFL2	- -	- -	- -	- -	- -	0,81 (0,01) 40,28
HONO1	- -	- -	- -	- -	- -	- -
HONO2	- -	- -	- -	- -	- -	- -
DECI1	- -	- -	- -	- -	- -	- -
DECI2	- -	- -	- -	- -	- -	- -
VALU1	- -	- -	- -	- -	- -	- -
VALU2	- -	- -	- -	- -	- -	- -
LEAR1	- -	- -	- -	- -	- -	- -
LEAR2	- -	- -	- -	- -	- -	- -
MANA1	- -	- -	- -	- -	- -	- -
MANA2	- -	- -	- -	- -	- -	- -
TREA1	- -	- -	- -	- -	- -	- -
TREA2	- -	- -	- -	- -	- -	- -
INSP1	- -	- -	- -	- -	- -	- -
INSP2	- -	- -	- -	- -	- -	- -
COOR1	- -	- -	- -	- -	- -	- -
COOR2	- -	- -	- -	- -	- -	- -

ACTI1	- -	- -	- -	- -	- -	- -
ACTI2	- -	- -	- -	- -	- -	- -
PLAN1	- -	- -	- -	- -	- -	- -
PLAN2	- -	- -	- -	- -	- -	- -
REVI1	- -	- -	- -	- -	- -	- -
REVI2	- -	- -	- -	- -	- -	- -
REWA1	- -	- -	- -	- -	- -	- -
REWA2	- -	- -	- -	- -	- -	- -

	HONO	DECI	VALU	LEAR	MANA	TREA
AWEX1	- -	- -	- -	- -	- -	- -
AWEX2	- -	- -	- -	- -	- -	- -
AWIN1	- -	- -	- -	- -	- -	- -
AWIN2	- -	- -	- -	- -	- -	- -
VISI1	- -	- -	- -	- -	- -	- -
VISI2	- -	- -	- -	- -	- -	- -
TRUS1	- -	- -	- -	- -	- -	- -
TRUS2	- -	- -	- -	- -	- -	- -
ARTI1	- -	- -	- -	- -	- -	- -
ARTI2	- -	- -	- -	- -	- -	- -
STRA1	- -	- -	- -	- -	- -	- -
STRA2	- -	- -	- -	- -	- -	- -
RISK1	- -	- -	- -	- -	- -	- -
RISK2	- -	- -	- -	- -	- -	- -
LEAD1	- -	- -	- -	- -	- -	- -
LEAD2	- -	- -	- -	- -	- -	- -
FOLL1	- -	- -	- -	- -	- -	- -
FOLL2	- -	- -	- -	- -	- -	- -
SYST1	- -	- -	- -	- -	- -	- -
SYST2	- -	- -	- -	- -	- -	- -
CULT1	- -	- -	- -	- -	- -	- -
CULT2	- -	- -	- -	- -	- -	- -
INFL1	- -	- -	- -	- -	- -	- -
INFL2	- -	- -	- -	- -	- -	- -
HONO1	0,78 (0,02) 36,70	- -	- -	- -	- -	- -
HONO2	0,78 (0,01) 36,70	- -	- -	- -	- -	- -
DECI1	- -	0,75 (0,02) 34,83	- -	- -	- -	- -
DECI2	- -	0,82 (0,01) 40,00	- -	- -	- -	- -
VALU1	- -	- -	0,80 (0,02) 38,27	- -	- -	- -
VALU2	- -	- -	0,77 (0,01) 35,77	- -	- -	- -
LEAR1	- -	- -	- -	0,80 (0,02) 38,59	- -	- -
LEAR2	- -	- -	- -	0,79 (0,02) 38,27	- -	- -
MANA1	- -	- -	- -	- -	0,80 (0,02) 40,79	- -
MANA2	- -	- -	- -	- -	0,81 (0,02) 38,99	- -
TREA1	- -	- -	- -	- -	- -	0,85 (0,01) 44,67
TREA2	- -	- -	- -	- -	- -	0,85 (0,02) 43,74
INSP1	- -	- -	- -	- -	- -	- -
INSP2	- -	- -	- -	- -	- -	- -
COOR1	- -	- -	- -	- -	- -	- -
COOR2	- -	- -	- -	- -	- -	- -
ACTI1	- -	- -	- -	- -	- -	- -
ACTI2	- -	- -	- -	- -	- -	- -

PLAN1	- -	- -	- -	- -	- -	- -
PLAN2	- -	- -	- -	- -	- -	- -
REVI1	- -	- -	- -	- -	- -	- -
REVI2	- -	- -	- -	- -	- -	- -
REWA1	- -	- -	- -	- -	- -	- -
REWA2	- -	- -	- -	- -	- -	- -

	INSP	COOR	ACTI	PLAN	REVI	REWA
AWEX1	- -	- -	- -	- -	- -	- -
AWEX2	- -	- -	- -	- -	- -	- -
AWIN1	- -	- -	- -	- -	- -	- -
AWIN2	- -	- -	- -	- -	- -	- -
VISI1	- -	- -	- -	- -	- -	- -
VISI2	- -	- -	- -	- -	- -	- -
TRUS1	- -	- -	- -	- -	- -	- -
TRUS2	- -	- -	- -	- -	- -	- -
ARTI1	- -	- -	- -	- -	- -	- -
ARTI2	- -	- -	- -	- -	- -	- -
STRA1	- -	- -	- -	- -	- -	- -
STRA2	- -	- -	- -	- -	- -	- -
RISK1	- -	- -	- -	- -	- -	- -
RISK2	- -	- -	- -	- -	- -	- -
LEAD1	- -	- -	- -	- -	- -	- -
LEAD2	- -	- -	- -	- -	- -	- -
FOLL1	- -	- -	- -	- -	- -	- -
FOLL2	- -	- -	- -	- -	- -	- -
SYST1	- -	- -	- -	- -	- -	- -
SYST2	- -	- -	- -	- -	- -	- -
CULT1	- -	- -	- -	- -	- -	- -
CULT2	- -	- -	- -	- -	- -	- -
INFL1	- -	- -	- -	- -	- -	- -
INFL2	- -	- -	- -	- -	- -	- -
HONO1	- -	- -	- -	- -	- -	- -
HONO2	- -	- -	- -	- -	- -	- -
DECI1	- -	- -	- -	- -	- -	- -
DECI2	- -	- -	- -	- -	- -	- -
VALU1	- -	- -	- -	- -	- -	- -
VALU2	- -	- -	- -	- -	- -	- -
LEAR1	- -	- -	- -	- -	- -	- -
LEAR2	- -	- -	- -	- -	- -	- -
MANA1	- -	- -	- -	- -	- -	- -
MANA2	- -	- -	- -	- -	- -	- -
TREA1	- -	- -	- -	- -	- -	- -
TREA2	- -	- -	- -	- -	- -	- -
INSP1	0,89 (0,01) 48,54	- -	- -	- -	- -	- -
INSP2	0,88 (0,01) 47,02	- -	- -	- -	- -	- -
COOR1	- -	0,84 (0,02) 43,53	- -	- -	- -	- -
COOR2	- -	0,87 (0,01) 46,70	- -	- -	- -	- -
ACTI1	- -	- -	0,73 (0,02) 32,55	- -	- -	- -
ACTI2	- -	- -	0,81 (0,02) 40,93	- -	- -	- -
PLAN1	- -	- -	- -	0,85 (0,01) 44,97	- -	- -
PLAN2	- -	- -	- -	0,83 (0,01) 42,11	- -	- -
REVI1	- -	- -	- -	- -	0,89 (0,01) 47,86	- -
REVI2	- -	- -	- -	- -	0,85 (0,02) 46,55	- -
REWA1	- -	- -	- -	- -	- -	0,86

						(0,02)
						45,12
REWA2	- -	- -	- -	- -	- -	0,90
						(0,02)
						50,55

A satisfactory proportion of the variance in each indicator variable is explained by its underlying latent variable ($0,56 \leq R^2 \geq 0,81$), with the exception of the first risk parcel (0,46). Standardized residuals are distributed symmetrically around zero. In contrast to the relatively optimistic inferences on model fit derived from the foregoing indices, the number of extreme residuals resulting from the fitted measurement model (smallest standardized residual, -142,49; median residual, 0 and largest standardized residual, 82,84) seem to attest otherwise. In fairness, however, it should be stated that the smallest and largest unstandardized residuals are –0,10 and 0,06 respectively.

According to Theron and Spangenberg (2005) the modification indices calculated for the factor loading matrix indicated that there were a somewhat disappointingly large number of additional paths which would significantly improve the fit of the model. By examining the magnitude of the modification index values together with the magnitude and sign of the standardized expected change values it became clear that a number of the item parcels that were meant to be reflections of a single underlying latent variable could be factorially complex. Specific LBI items were explicitly and intentionally written to function as homogenous stimulus sets to which raters would respond with behaviour which would be relatively uncontaminated behavioural expressions of specific latent leadership dimensions. On examination of the results (specifically the R^2 for observed variables), the indicator variables do seem to provide a satisfactory empirical grasp on the underlying latent variables they were meant to reflect. However, many of the indicator variables also provide information on latent variables they were not designed to reflect (given the magnitude of the modification index values and standardized expected change values). Theron and Spangenberg (2005) concluded that for the moment it would be best to remain faithful to the original design intentions and not free any additional elements in Λ_X. They further stated that if the use of factorially complex items would be accepted as a basic design principle, then the architects of the LBI should re-examine each of the current items and hypothesize specific additional non-zero loadings on specific latent leadership dimensions where applicable in advance.

The phi-matrix correlations were all high to extremely high which is in accordance with the Ferrando and Lorenzo-Seva (2000) finding that the inter-factor correlations are typically overestimated when analyzing a set of factorially impure items with a typical CFA model. Even though the initial admissibility test was passed, the Φ matrix was not positive definite with off-diagonal entries exceeding unity. As a result, this diminishes confidence in the quality of the obtained solution. However, this further supports the need to investigate a higher-order factor structure of the LBI (Theron & Spangenberg, 2005).

4.2 EVALUATION OF THE SECOND-ORDER MEASUREMENT MODEL

Equation 1 that expresses the observed scores achieved on the composite LBI indicator variables as a function of the underlying first-order latent variables and measurement error can be rewritten as an endogenous model:

$Y = \Lambda_y\eta + \varepsilon$--2

Variance in the first-order endogenous latent leadership competencies (η) can, however, in turn be assumed to be expressions of a smaller set of two second-order latent leadership variables (ξ) and specification error, so that:

$\eta = \Gamma\xi + \zeta$---3

where:

η is a 24x1 column vector of first-order latent leadership competencies, Γ is a 24x2 matrix of second-order factor loadings, ξ is a 2x1 column vector of second-order latent leadership competencies; and ζ is a 24x1 column vector of structural disturbance terms.

Combining equations 2 and 3 results in equation 4:

$Y = \Lambda_y(\Gamma\xi + \zeta) + \varepsilon$--4

The assumption that the first-order latent leadership competencies do not affect each other is reflected by the absence of any reference to a B matrix in equations 3 and 4. Whether this assumption is justified must be carefully considered and evaluated. Theron and Spangenberg (2005) provided an explanation that challenging this assumption seems to go contrary to the traditional views on higher-order factor structures. However, the viewpoint that first-order latent leadership competencies exerting influence on each other is not something that should be completely dismissed. The measurement model depicted in Figure 1 will be fitted in which it is assumed that all the elements of B are zero and therefore can be left out of equations 3 and 4. According to equation 4 the items from any LBI subscale correlate high amongst each other as they all measure the same, relatively narrow underlying (first-order) latent variable. These first-order latent leadership competencies on the other hand correlate with each other as they are expressions of one or more, more general (second-order) latent variables. Although the more general latent variables explains a significant proportion of the variance in the first-order latent variables, a substantial proportion of the variance in the first-order latent variables could also be attributed to the systematic influence of other unspecified latent variables (Hull *et al.*, 1995).

Equations 3 and 4, in conjunction with Figure 1, imply the statistical hypotheses presented in Table 10 on the Γ population matrix.

TABLE 10
STATISTICAL HYPOTHESES ON THE Γ POPULATION MATRIX

Hypothesis 1: H_{01}: $\gamma_{1,1} = 0$ H_{a1}: $\gamma_{1,1} > 0$	Hypothesis 6: H_{06}: $\gamma_{6,1} = 0$ H_{a6}: $\gamma_{6,1} > 0$	Hypothesis 11: H_{011}: $\gamma_{10,1} = 0$ H_{a11}: $\gamma_{10,1} >0$	Hypothesis 16: H_{016}: $\gamma_{14,2} = 0$ H_{a16}: $\gamma_{14,2} > 0$	Hypothesis 21: H_{021}: $\gamma_{19,2} = 0$ H_{a21}: $\gamma_{19,2} > 0$	Hypothesis 26: H_{026}: $\gamma_{24,1} = 0$ H_{a26}: $\gamma_{24,1} > 0$
Hypothesis 2: H_{02}: $\gamma_{2,1} = 0$ H_{a2}: $\gamma_{2,1} > 0$	Hypothesis 7: H_{07}: $\gamma_{7,2} = 0$ H_{a7}: $\gamma_{7,2} > 0$	Hypothesis 12: H_{012}: $\gamma_{11,1} = 0$ H_{a12}: $\gamma_{11,1} > 0$	Hypothesis 17: H_{017}: $\gamma_{15,1} = 0$ H_{a17}: $\gamma_{15,1} > 0$	Hypothesis 22: H_{022}: $\gamma_{20,1} = 0$ H_{a22}: $\gamma_{20,1} > 0$	
Hypothesis 3: H_{03}: $\gamma_{3,2} = 0$ H_{a3}: $\gamma_{3,2} > 0$	Hypothesis 8 H_{08}: $\gamma_{8,2} = 0$ H_{a8}: $\beta_{8,2} > 0$	Hypothesis 13: H_{013}: $\gamma_{12,1} = 0$ H_{a13}: $\gamma_{12,1} > 0$	Hypothesis 18: H_{018}: $\gamma_{16,1} = 0$ H_{a18}: $\gamma_{16,1} > 0$	Hypothesis 23: H_{023}: $\gamma_{21,2} = 0$ H_{a23}: $\gamma_{21,2} > 0$	
Hypothesis 4: H_{04}: $\gamma_{4,2} = 0$ H_{a4}: $\gamma_{4,2} > 0$	Hypothesis 9: H_{09}: $\gamma_{9,1} = 0$ H_{a9}: $\beta_{9,1} > 0$	Hypothesis 14: H_{014}: $\gamma_{12,2} = 0$ H_{a14}: $\gamma_{12,2} > 0$	Hypothesis 19: H_{019}: $\gamma_{17,1} = 0$ H_{a19}: $\gamma_{171} > 0$	Hypothesis 24: H_{024}: $\gamma_{22,1} = 0$ H_{a24}: $\gamma_{22,1} > 0$	
Hypothesis 5: H_{05}: $\gamma_{5,2} = 0$ H_{a5}: $\gamma_{5,2} > 0$	Hypothesis 10: H_{010}: $\gamma_{9,2} = 0$ H_{a10}: $\gamma_{9,2} > 0$	Hypothesis 15: H_{04}: $\gamma_{13,2} = 0$ H_{a4}: $\gamma_{13,2} > 0$	Hypothesis 20: H_{020}: $\gamma_{18,1} = 0$ H_{a20}: $\gamma_{18,1} > 0$	Hypothesis 25: H_{025}: $\gamma_{23,1} = 0$ H_{a25}: $\gamma_{23,1} > 0$	

Confirmatory second-order factor analysis was performed using LISREL 8.54 (Du Toit & Du Toit, 2001) on the LBI to determine the fit of the model expressed as equation 4 and depicted as Figure 1. The imputed item parcel data was first read into PRELIS (Jöreskog & Sörbom, 1996b) to compute covariance and asymptotic covariance matrices to serve as input for the LISREL analysis. The model fit was evaluated through an analysis of a covariance matrix due to the assumed continuous nature of the item parcels. As a result of the lack of multivariate normality in the data robust maximum likelihood estimation was used to estimate the parameters set free in the model. The asymptotic covariance matrix was thus also calculated.

4.2.1 Model Identification

Before confronting the model with data, model identification needs to be examined. It is important to determine whether the nature of the model and data would allow the determination of unique estimates for the freed parameters in the model. This would be possible if for each free parameter there would

exist at least one algebraic function that expresses that parameter as a function of sample variances/covariances terms (MacCallum, 1995). For the model to be identified, two critical conditions must be met. Firstly, a definite scale must be identified for each latent variable. Secondly, the number of model parameters to be estimated cannot be more that the number of unique variance/covariance terms in the sample observed covariance matrix (Diamantopoulos & Siguaw, 2000; MacCallum, 1995). The model as displayed in Figure 1 can be fitted in a manner that satisfies both these critical conditions for model identification. The first requirement will be met by treating each latent variable as a (0; 1) standardized variable (MacCallum, 1995). The number of model parameters that are set free to be estimated (t=123) are less than the number of non-redundant elements in the observed sample covariance matrix ([(p+q)(p+q+1)]/2=[(48+0)(48+0+1)]/2=2352/2=1176)[1]
(Diamantopoulos & Siguaw, 2000). The degrees of freedom are therefore 1176-132=1053.

4.2.2 Assessing overall goodness-of-fit of the second-order measurement model

An admissible final solution of parameter estimates for the LBI second-order measurement model was obtained after 91 iterations. Table 11 provides the full spectrum of indices generated by LISREL, which reflects the absolute and comparative fit of the proposed second-order measurement model. Structural Equation Modeling (SEM) has no single statistical test that best describes the 'strength' of the model's predictions (Hair *et al.*, 1998). Bollen (1989, p. 275) addresses this issue by stating that "overall selecting a rigid cutoff for the incremental fit indices is like selecting a minimum R for a regression equation. Any value will be controversial. Awareness of the factors affecting the values and good judgement are the best guides to evaluating their size." When considering the spectrum of fit measures depicted in Table 11 an integrative judgment must be attained.

TABLE 11
GOODNESS OF FIT STATISTICS SECOND-ORDER MEASUREMENT MODEL

Fit index	Value
Degrees of Freedom	1053
Minimum Fit Function Chi-Square	9461,83 (P = 0,0)
Normal Theory Weighted Least Squares Chi-Square	14574,51 (P = 0,0)
Satorra-Bentler Scaled Chi-Square	12171,77 (P = 0,0)
Chi-Square Corrected for Non-Normality	9376,11 (P = 0,0)
Estimated Non-centrality Parameter (NCP)	11118,77
90 Percent Confidence Interval for NCP	(10767,02 ; 11477,48)
Minimum Fit Function Value	5,97
Population Discrepancy Function Value (F0)	7,01
90 Percent Confidence Interval for F0	(6,79 ; 7,24)

[1] p=the number of y-variables; q=the number of x-variables; in this case q=0.

Root Mean Square Error of Approximation (RMSEA)	0,082
90 Percent Confidence Interval for RMSEA	(0,080 ; 0,083)
P-Value for Test of Close Fit (RMSEA < 0.05)	0,00
Expected Cross-Validation Index (ECVI)	7,83
90 Percent Confidence Interval for ECVI	(7,61 ; 8,06)
ECVI for Saturated Model	1,48
ECVI for Independence Model	397,54
Chi-Square for Independence Model with 1128 Degrees of Freedom	630009,86
Independence AIC	630105,86
Model AIC	12417,77
Saturated AIC	2352,00
Independence CAIC	630411,57
Model CAIC	13201,15
Saturated CAIC	9841,91
Normed Fit Index (NFI)	0,98
Non-Normed Fit Index (NNFI)	0,99
Parsimony Normed Fit Index (PNFI)	0,92
Comparative Fit Index (CFI)	0,99
Incremental Fit Index (IFI)	0,99
Relative Fit Index (RFI)	0,98
Critical N (CN)	195,77
Root Mean Square Residual (RMR)	0,026
Standardized RMR	0,043
Goodness of Fit Index (GFI	0,72
Adjusted Goodness of Fit Index (AGFI)	0,69
Parsimony Goodness of Fit Index (PGFI	0,65

According to Table 11 the Satorra-Bentler χ^2 test statistic is 12171,77. This value is significant ($p<0,01$) and as a result indicates a rejection of the null hypothesis of exact model fit (H_0: $\Sigma=\Sigma(\theta)$). Consequently, the second-order measurement model is not able to reproduce the observed covariance matrix to a degree of accuracy that could be explained in terms of sampling error only. By expressing χ^2 in terms of degrees of freedom ($\chi^2/df = 11,55913$) provides an indication that the second-order measurement model shows poor fit when evaluated from the perspective of exact population fit (Schumacker & Lomax, 1996). However, Kelloway (1998) explained that the values traditionally used to indicate good fit (ratios between 2 and 5) do not have a rigorous theoretical basis and rely on little more than the researcher's personal modeling experience. Therefore, the normed chi square statistic should be used with caution.

The Estimated Non-centrality Parameter (NCP) provides an indication of the estimated discrepancy between the observed (Σ_0) and estimated population covariance ($\widetilde{\Sigma}_0$) matrices (Diamantopoulos & Siguaw, 2000). By examining Table 11 the NCP value is 11118,77. The second-order measurement model was fitted by minimizing a fit function that compares the sample observed covariance matrix (s) to a reproduced sample covariance matrix ($\hat{\Sigma}$) derived from the model parameter estimates (Jöreskog &

Sörbom, 1993). The minimum fit function value (5,97) provides an indication of model fit. The closer the value approaches zero the better the indication of model fit.

The Population Discrepancy Function Value (F_0) explains the degree to which the observed population covariance matrix (Σ_0) is estimated to differ from the reproduced population covariance matrix ($\tilde{\Sigma}_0$) resulting from the model parameters minimizing the selected discrepancy function when fitting the model on (Σ_0) (Browne & Cudeck, 1993). The (F_0) value is 7,01 with confidence limits of 7,61 and 8,06. If (F_0) had been zero perfect exact fit would have been achieved as Σ_0 would have been equal to $\tilde{\Sigma}_0$.

The Root Mean Square Error of Approximation (RMSEA) is representative of the goodness-of-fit that could be expected if the model were estimated in the population, and not only from the sample drawn for the estimation. Values ranging from 0,05 to 0,08 are deemed acceptable (Hair *et al*., 1998) but with a RMSEA equal to 0,08 already indicating mediocre fit. The RMSEA expresses the error due to approximation per degree of freedom of the model. The RMSEA value of 0,082 thus indicates a slightly poorer than mediocre fit.

A test of close fit (in contrast to exact fit) is performed by LISREL by testing H_0: RMSEA $\leq$ 0,05 against H_a: RMSEA > 0,05. The RMSEA value of 0,082 is significantly greater than the target value of 0,05 (that is H_0 is rejected; $p < 0,05$). As the confidence interval (0,080 – 0,083) does not include the target value of 0,05, a good fit has not been achieved.

The expected cross-validation index (ECVI) is an approximation of the goodness-of-fit the estimated model would achieve in another sample of the same size (Hair *et al*., 1998). This index provides an indication of the difference between the reproduced sample covariance matrix ($\hat{\Sigma}$). This is derived from fitting the model on the sample at hand and the expected covariance matrix that would be obtained in another sample of the same size and from the same population (Byrne, 1998; Diamantapolous & Siguaw, 2000). It therefore focuses on the difference between $\hat{\Sigma}$ and Σ. The ECVI is smaller that the value obtained for the independence model however, it is larger than the value obtained for the saturated model. Therefore, a model which more closely resembles the saturated model would probably have a better chance of being replicated in a cross-validation sample rather than the fitted model.

Parsimonious fit measures relates to the goodness-of-fit of the model to the number of estimated coefficients required to achieve this level of fit. According to Hair *et al*. (1998) the basic objective of parsimonious fit measures is to diagnose whether model fit has been achieved by 'overfitting' the data with too many coefficients. Model fit can be improved by adding more paths to the model and estimating more parameters until perfect fit is achieved in the form of a saturated or just-identified model with no degrees of freedom (Kelloway, 1998). The aim in model building is to achieve satisfactory fit with as few model parameters as possible (Jöreskog & Sörbom, 1993). The objective is to find the most parsimonious model. Indices of parsimonious fit relate the benefit that accrues in terms of improved fit to the cost incurred (in terms of degrees of freedom lost) to affect the improvement in fit (Hair *et al*., 1998; Jöreskog & Sörbom, 1993). The parsimonious normed fit index (PNFI = 0,92) and the parsimonious goodness-of-fit index (PGFI = 0,65) as displayed in Table 11 looks at model fit from this perspective. These results necessitates a second, explicitly formulated and fitted model that contains a number of additional paths that can be theoretically justified so that the initial model is nested within the more elaborate model. In this situation an alternative model does not exist (Theron and Spangenberg, 2005).

Values for the Akaike Information Criterion (AIC) that are closer to zero indicate better fit and greater parsimony. This provides an indication of good fit of observed versus predicted covariances or correlations but also a model not prone to 'overfitting' (Hair *et al*., 1998). The values for the Akaike Information Criterion (AIC = 12417,77) and the Consistent Akaike Information Criterion (CAIC = 13201,15) are shown in Table 11. The results provide an indication that the fitted structural model provides a more parsimonious fit than the independent/null model but not the saturated model since smaller values on these indices indicate a more parsimonious model (Kelloway, 1998). These results taken together with the ECVI results seem to suggest that the model lacks a number of influential paths. Theron and Spangenberg (2005) reached a similar conclusion in regarding the fit of their five second-order measurement model. According to Theron and Spangenberg (2005) the current model could be deficient in as far as it fails to represent the influences between specific first-order leadership competencies.

The incremental fit measure compares the current model (a baseline model) to a specified null model to determine the degree of improvement over the null model (Hair *et al*., 1998). According to Theron and Spangenberg (2005) indices of comparative fit that use as a baseline an independence or null model, contrast the ability of the model to reproduce the observed covariance matrix with that of a model known as a priori to fit the data poorly, namely one that postulates no paths between the variables in the model. The indices of comparative fit are shown in Table 11. The results seem to indicate good model fit relative to that of the independence model. These indices all can assume values between 0 and 1 with 0,90 generally considered indicative of a well-fitting model (Bentler, 1990; Bentler & Bonett, 1980; Hair *et al*., 1995; Kelloway, 1998). The values of the aforementioned indices all exceed the critical value of 0,90. This indicates a good comparative fit relative to the independence model.

The critical sample size statistic (CN) provides an indication of the sample size that would have made the obtained minimum fit function χ^2 statistic significant at the 0,05 significance level. The Critical N value is 195,77 which falls short of the recommended threshold value of 200 which is indicative of the model providing an adequate representation of the data (Diamantopoulos & Siguaw, 2000). However, according to Hu and Bentler (1995) this proposed threshold should be used with caution.

The Root Mean Square Residual (RMSR) is 0,026 and the standardized root mean square is 0,043 which indicate acceptable fit. Values that are less than 0,05 on the standardized root mean square residual indicates that the model fits the data well (Kelloway, 1998).

The goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI) and the parsimony goodness-of-fit index (PGFI) provide an indication of the success with which the reproduced sample covariance matrix recovered the observed sample covariance matrix (Diamantopoulos & Siguaw, 2000; Schamacker & Lomax, 1996). The goodness-of-fit index represents the overall degree of fit, however, it is not adjusted for the degrees of freedom. The adjusted goodness-of-fit index is an extension of the GFI which is adjusted by the ration of degrees of freedom for the proposed model to the degrees of freedom for the null model (Hair *et al*., 1998). These two indexes should be between zero and unity with values exceeding 0,90 indicating good fit to the data (Jöreskog and Sörbom, 1993; Kelloway, 1998). The goodness-of-fit index is 0,72 and the adjusted goodness-of-fit index is 0,69. This indicates that the model does not fit the data well. According to Kelloway (1998) the guidelines used for the interpretation of GFI and AGFI are grounded in experience, are somewhat arbitrary and as a result should be used with caution. Where the AGFI's adjustment of the GFI was based on the degrees of freedom in the estimated and null models the parsimonious goodness-of-fit index is based on the parsimony of the estimated model. The PGFI is 0,65. Values vary between zero and 1,0 with higher values indicating greater model parsimony (Hair *et al*., 1998). By collectively evaluating the results for model fit it becomes clear that the measures suggest a reasonable to mediocre fitting model that outperforms the independence model. However, it fails to satisfactorily capture the complexity of the processes that underlie the LBI.

4.2.3 Examination of residuals

Residuals can be defined as the difference between corresponding cells in the observed and fitted covariance/correlation matrices (Diamantopoulous & Siguaw, 2000; Jöreskog & Sörbom, 1993; Kelloway, 1998). A stem and leaf plot of the standardized residuals is provided in Figure 2.

Standardised residuals that are large positive and negative provide an indication of relationships (or the lack thereof) between indicator variables that the model fails to explain adequately. Standardized residuals can be interpreted as standard normal deviates, that is, z-scores. Diamantopoulos and Siguaw (2000) state that standardized residuals with absolute values greater than 2,58 could be considered large. Large positive residuals indicate that the model underestimates the covariance between two observed variables. To rectify the problem would require adding paths to the model. On the other hand, large negative residuals indicate that the model overestimates the covariance between specific observed variables. The solution in this instance would require reducing paths that are associated with these indicator variables (Diamantopoulos & Siguaw, 2000; Kelloway, 1998).

```
- 4|2211
 - 3|9
 - 3|2
 - 2|6
 - 2|22000
 - 1|87776665555
 - 1|4443333322211111000000000000
 - 0|99999999999888888888888888887777777777777777777777777777777777766666666666666+69
 - 0|44444444444444444444444444444444444444444444444444444444444333333333333333333+95
   0|11111111111111111111111111111111111111111111111111111111111111111111111111111+99
   0|55555555555555555555555555555555555555566666666666666666666666666666777777777+40
   1|000000000000001111111122223344
   1|677788
   2|1
   2|7
   3|4
   3|7
   4|14
   4|8
```

FIGURE 2. STEM-AND-LEAF PLOT OF STANDARDISED RESIDUALS

The standardized residual plot depicted in Figure 2 confirms the conclusion reached from the spectrum of fit indices depicted in Table 11 that only reasonable to mediocre model fit had been achieved. The standardised residuals vary between -42,26 and 48,02 with a median standardised residual of 0,00. An alarming 305 of the 1176 residual covariance terms are smaller than -2,58 while an equally disturbing 269 of the 1176 residual covariance terms are larger than 2,58. The distribution of standardized residuals is symmetrical around zero. The unstandardised covariance residuals, however, vary between -0,08 and 0,18 with a median fitted residual of 0,00.

Good model fit would further have been indicated if the standardized residuals for all pairs of observed variables had fallen approximately on a 45° reference line in the Q-plot. The Q-plot of standardized residuals is shown in Figure 3.

The rather marked angular deviation of the standardized residuals for all pairs of observed variables from the 45° -reference line in the Q-plot both in the upper and lower regions of the X-axis indicated unsatisfactory model fit.

4.2.4 Model Modification indices

Modifications to the model should be made only after deliberate consideration. Modifications must be made with care and only after obtaining theoretical justification for what is empirically deemed significant. If modifications are made, the model should be cross-validated before the modified model can be accepted. Although modification indices can be useful in assessing the impact of theoretically based model modifications, model changes should never be made solely on modification indices (Hair *et al*., 1998). By examining the standardized residuals, it becomes clear that the addition of one or more paths would probably improve the fit of the model. The next step would be to determine which paths when added to the model would significantly improve the parsimonious fit of the model.

The modification indices calculated by LISREL show the decrease in the χ^2 statistic if currently fixed parameters are set free and the model re-estimated. Large modification index values (>6,6349) indicate parameters that, if set free, would improve the fit of the model significantly ($p<0,01$) (Diamantopoulos & Siguaw, 2000). By examining the modification indices for Λ_Y matrix it becomes clear that there are a large number of modification index values larger than 6,64. Consequently, this suggests that there are quite a few additional paths (first-order factor loadings) that would improve the model fit of the second-order measurement model.

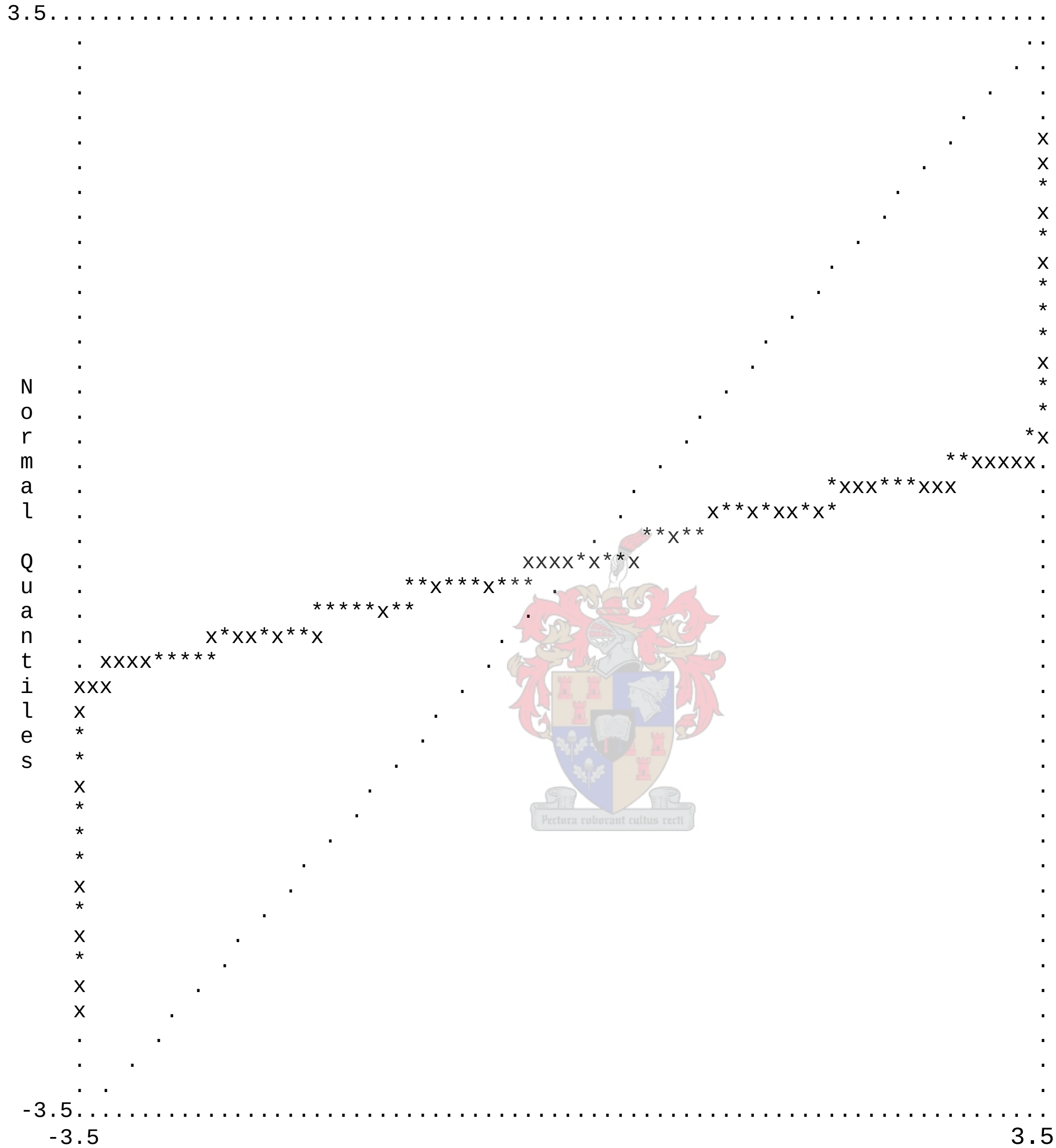

FIGURE 3. Q-PLOT OF STANDARDIZED RESIDUALS

This stands in rather sharp contrast with the findings reported by Spangenberg and Theron (2002) in the original evaluation of the primary measurement model. In the original confirmatory factor analysis the modification indices and the completely standardized expected parameter change associated with the fixed parameters in Λ_X indicated only a small number of paths, that if added to the model, should result in notable decreases in the χ^2 measure. Whether the suggested cross-loading between item parcels is solely because of the difficulty of isolating factorially pure leadership denotations or also in part attributable to causal influences existing between the latent first-order leadership dimensions is a debatable point. The most prudent approach for the moment probably would be not to pursue the possibility of item parcels loading on more than one primary factor until such time that this practice will be reflected in the scoring key of the LBI.

The modification indices for the B matrix reflect a large number of additional paths that would improve the fit of the second-order measurement model. Theron and Spangenberg (2005) obtained a similar result for their proposed five second-order factor measurement model. Theron and Spangenberg (2005) interpreted the large number of large modification indices in the B matrix as providing support for the assumption that it might be necessary to make provision for causal influences among the first-order leadership competencies. They further argued that it would probably be best to keep the initially proposed second-order hypothesis for the moment and not free any elements in the B matrix. They did, however, recommend that the second-order hypothesis should in future be re-examined by adding theoretically justifiable causal linkages between the first-order leadership competencies. They moreover argued that theoretically justifiable causal linkages should dictate the elements of the B matrix to be freed rather than the empirically derived modification indices (Theron & Spangenberg, 2005). The same argument also seems to apply to the current analysis.

By examining the modification indices and the completely standardized parameter change with the fixed parameters in the Θ_ε matrix indicates that if the covariance terms are set free there would be significant ($p < 0{,}01$) decreases in the χ^2 measure. However, the expected magnitude of the completely standardized covariate estimates does not justify setting these parameters free (Theron & Spangenberg, 2005). The modification indices for the variance-covariance matrix Ψ suggest that by allowing for correlations amongst the residual error terms ζ would result in a significant model fit improvement. As there is not a convincing theoretical argument to do so it would not be advisable to free the off-diagonal elements in the Ψ matrix.

The modification indices calculated for the Γ-matrix indicate that freeing any of the currently fixed elements of the second-order factor matrix would not produce a significant improvement in model fit.

4.2.5 Assessment of the second-order factor model

The completely standardized gamma matrix (Γ) is displayed in Table 12. The gamma matrix provides an indication of the regression of the first-order factors η_i on the second-order factors ξ_j and is used to evaluate the significance of the second-order factor loadings hypothesized by the proposed second-order measurement model displayed in Figure 1 (Theron & Spangenberg, 2005).

On examination of the results shown in Table 12 all the second-order factor loadings are significant ($p<0,05$) except two, empowering followers (Foll) on the transformational second-order factor and influencing the external environment (Influ) on the transactional second-order factor. All the statistical null hypotheses stated depicted in Table 10 can thus be rejected in favour of H_{ai} except for H_{010} and H_{013}. Theron and Spangenberg (2005, p. 44) explain that "the completely standardized Γ parameter estimates reflect the average change in standard deviation units in an first-order endogenous latent variable directly resulting from one standard deviation change in a second-order exogenous latent variable to which it has been linked, holding the effect of all the other variables constant." According to Table 12 the first–order leadership factors load quite high on the second-order factors that they are linked to but for, empowering followers and influencing the external environment which are the only two first-order factor loadings that are weak and insignificant.

TABLE 12
COMPLETELY STANDARDISED GAMMA (Γ) MATRIX

	Transact	Transform
Awex	0,80 (0,03) 30,89	- -
Awin	0,92 (0,03) 34,83	- -
Visi	- -	1,00 (0,02) 43,71
Trus	- -	0,99 (0,02) 44,19
Arti	- -	0,97 (0,02) 44,88
Stra	0,94 (0,02) 38,47	- -
Risk	- -	0,93 (0,03) 30,13

Lead	- -	0,90 (0,03) 31,00
Foll	1,11 (0,15) 7,52	-0,12 (0,15) -0,85
Syst	0,95 (0,02) 39,60	- -
Cult	0,99 (0,02) 43,10	- -
Infl	-0,11 (0,17) -0,62	1,03 (0,17) 6,01
Hono	- -	0,95 (0,03) 37,31
Deci	- -	0,97 (0,03) 34,53
Valu	0,96 (0,03) 37,75	- -
Lear	0,97 (0,03) 34,60	- -
Mana	0,93 (0,03) 32,41	- -
Trea	0,85 (0,02) 34,56	- -
Insp	- -	0,96 (0,02) 45,86
Coor	0,94 (0,02) 41,07	- -
Acti	- -	0,97 (0,03) 32,18
Plan	0,96 (0,02) 44,53	- -
Revi	0,91 (0,02) 44,24	- -
Rewa	0,81 (0,02) 34,21	- -

*t-values > indicate significant path coefficients; values in brackets represent standard error estimates

Refitting the second-order factor model with the two insignificant second-order factor loadings removed resulted in no appreciable improvement in model fit. Although the decrease in the Satorra-

Bentler chi-square statistic is significant at two degrees of freedom the spectrum of fit indices depicted in Table 11 essentially remained unaffected.

Table 13 provides an indication of the squared multiple correlations for the endogenous latent variables in the model.

TABLE 13
SQUARED MULTIPLE CORRELATIONS FOR STRUCTURAL EQUATIONS

Awex	Awin	Visi	Trus	Arti	Stra	Risk	Lead	Foll	Syst	Cult	Infl
0,63	0,85	1,00	0,97	0,94	0,88	0,86	0,82	0,97	0,90	0,97	0,85
Hono	**Deci**	**Valu**	**Lear**	**Mana**	**Trea**	**Insp**	**Coor**	**Acti**	**Plan**	**Revi**	**Rewa**
0,90	0,94	0,93	0,94	0,86	0,73	0,92	0,89	0,94	0,93	0,83	0,66

Table 14 displays the completely standardized Ψ matrix depicting the variance in the residual error terms ζ. The residual error terms ζ formally acknowledge that all the variance in the endogenous latent variables will not be explained completely by the model as some of the variance may be due to effects that are not included in the model.

TABLE 14
COMPLETELY STANDARDISED PSI (Ψ) MATRIX

Awex	Awin	Visi	Trus	Arti	Stra	Risk	Lead	Foll	Syst	Cult	Infl
0,37	0,15	0,00	0,03	0,06	0,12	0,14	0,18	0,03	0,10	0,03	0,15
Hono	**Deci**	**Valu**	**Lear**	**Mana**	**Trea**	**Insp**	**Coor**	**Acti**	**Plan**	**Revi**	**Rewa**
0,10	0,06	0,07	0,06	0,14	0,27	0,08	0,11	0,06	0,07	0,17	0,34

If influential latent effects on an endogenous are ignored this will be signaled by large variance terms associated with those endogenous latent variables. There are relatively large residual error variance terms in Table 14 for Awex, Lead, Trea, Revi, Rewa. The second-order factor structure is able to fully account for the variance in one factor, that is, Visi. This is in itself a bit suspicious, in a sense too good to be true.

4.3 COMPARISON OF LBI SECOND-ORDER FACTOR MODELS

When evaluating the results of Theron and Spangenberg's (2005) five-factor model and the Avolio *et al*. (1999) second-order factor model it becomes clear that both these models seem to suggest a reasonable to mediocre fitting model that outperforms the independence model. However, both these models fail to satisfactorily capture the complexity of the processes which underlie the LBI.

By examining the standardized residuals it becomes clear that the addition of one or more paths would probably improve the fit of both the models. According to Theron and Spangenberg (2005) in future the second-order hypothesis should be re-examined with the aim of adding theoretically justifiable causal linkages between the primary leadership competencies. This would also apply to the Avolio *et al* (1999) second-order factor model as there are quite a few additional paths that would improve the model fit of the second-order measurement model.

On examination of the results of the Theron and Spangenberg (2005) five–factor model the first-order leadership factors generally load quite high on the second-order factors to which they have been linked. The only insignificant loadings are of Plan on Indivrat and of Revi on Unitrat. On the Avolio *et al*. (1999) second-order factor model the first-order leadership factors generally also load quite highly except for empowering followers and influencing the external environment that are insignificant.

The five-factor second-order factor structure is able to fully explain the variance in two of the primary leadership factors, namely, Lear and Acti, however, for Awex, Lead, Infl, Trea, Revi and Rewa the model achieves relatively less success in accounting for the variance in these primary leadership dimensions. According to the Avolio *et al*. (1999) second-order factor model there is relatively large residual error variance for Awex, Lead, Trea, Revi and Rewa. The second-order factor structure is able to fully account for the variance in one factor, that is, Visi.

CHAPTER 5
SUMMARY, CONCLUSIONS AND RECOMMENDATIONSS

The leader's role has a pivotal role to play in the performance of a work unit and ultimately the success or failure of an institution. There is most probably a relationship between leadership characteristics and behaviour and the performance of a work unit. The performance of a work unit is not the outcome of a random event but rather systematically determined by an intricate nomological network of latent variables. According to Theron and Spangenberg (2005) to purposefully improve the performance of a work unit the identity of the latent variables comprising this nomological network must be known in combination with how they combine to affect the different performance dimensions. The manner in which leadership impacts on the performance of an organizational unit should be captured in a comprehensive leadership-unit performance structural model that would explain the way in which the various latent leadership dimensions affect the endogenous unit performance latent variables. To do so would be significantly simplified if initially leadership could be summarized in terms of a limited number of broader higher-order leadership factors.

The objective of this study is to derive a theoretically justifiable hypothesis on the second-order factor structure of the Leadership Behaviour Inventory (LBI) based on the Avolio, Bass and Jung (1999) second-order factor structure proposed for the MLQ and to empirically test the hypothesis by confronting the second-order measurement model with data.

Henning, Theron and Spangenberg (2004) reported on the validity of the measurement and structural models which underlie the Performance Index (PI). This together with the results on the Leadership Behaviour Inventory (LBI) reported in Spangenberg and Theron (2002) paved the way with the challenging task of explicating and evaluating a comprehensive leadership-unit performance structural model. By undertaking this task it would hopefully be easier to link the first-order leadership dimensions to the latent variables that comprise unit performance through elaboration of the basic model.

Theron and Spangenberg (2005) proposed a five-factor model as this seemed to offer a convincing theoretical account for the correlations existing between the primary factors. They reported reasonable to mediocre model fit and explained that the model did not satisfactory capture the true complexity of the processes underlying the LBI. An alternative second-order factor structure was proposed by Theron and Spangenberg (2005). The factor model for the MLQ by Avolio, Bass and Jung (1999) was suggested to be evaluated empirically. The current study performed the empirical model fitting on the same data set that was used to evaluate the five-factor model of Theron and Spangenberg (2005).

The first-order measurement model fits the data very well, however, there are indications that many of the indicator variables also provide information on latent variables they were not designed to reflect. By evaluating the results for the second-order measurement model fit it becomes clear that the fit measures suggest a reasonable to mediocre fitting model that outperforms the independence model. It nonetheless fails to satisfactory capture the complexity of the processes which underlie the LBI. In future the second-order hypothesis should be re-examined by adding theoretically justifiable causal linkages between the first-order leadership competencies. The theoretically justifiable causal linkages should dictate the elements of the B matrix to be freed rather than the empirically derived modification indices.

Henning *et al*. (2004) identified core people processes, adaptability and capacity as possible vital portals through which unit leadership could affect organizational unit performance. These three performance dimensions could be linked to the second-order factor model. The LBI transactional leadership factor could affect capacity and adaptability and the LBI transformational leadership factor could affect core people processes. However, there are a number of factors that load on the transactional leadership factor that could also affect core people processes. This also applies to the transformational leadership factor that could also affect capacity and adaptability. This could possibly be an unavoidable expression of the complex, intricate nature of leadership behaviour.

According to Theron *et al*. (2004) a number of latent variables like leader-follower trust, acceptance of the leader's influence (and possibly buy-in into the leader's vision) and procedural and distributive justice must be incorporated into a comprehensive leadership-unit performance structural model to meditate the effect of the leadership variables on unit performance.

In the future, before the development and testing of a leadership-unit performance structural model can be undertaken, the possibility that the covariance observed between the LBI first-order factors could be due to specific causal effects operating between the primary LBI leadership competencies should be evaluated empirically. Preferably, the analyses should be done on the same data set, which will facilitate the comparison of model fit.

REFERENCES

Avolio, B. J. & Bass, B. M. (1995). Individual consideration viewed at multiple levels of analysis: A multi-level framework for examining the diffusion of transformational leadership. *Leadership Quarterly*, 6,199-218.

Avolio, B. J., Bass, B. M. & Jung, D. I. (1999). Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire. *Journal of Occupational and Organisational Psychology*, 72, 441-462.

Bass, B. M. (1985). *Leadership and Performance beyond expectations*. New York: The Free Press.

Bass, B. M. (1988). The inspirational process of leadership. *Journal of Management Development*, 7, 21-31.

Bass, B. M. (1990). *Bass and Stogdill's Handbook of Leadership Theory, Research and Managerial Implications.* (3rd ed.). New York: Free Press.

Bass, B. M. & Avolio, B. (1990). *Transformational Leadership Development Manual for the Multifactor Leadership Questionnaire*. Palo Alta, CA: Consulting Psychologist Press.

Bass, B. M & Avolio, B. J. (1993). Transformational Leadership: A response to critiques. In M. Chemmers and R. Ayman (Eds). *Leadership theory and research perspectives and directions.* San Diego, CA: Academic Press.

Bass, B. M. & Avolio, B. J. (1994). *Improving organizational effectiveness through transformational leadership.* Thousand Oaks, CA: Sage.

Bass, B. M. (1996). *A new paradigm of leadership: An inquiry into transformational leadership*. Alexandria, VA: U. S. Army Research Institute for the Behavioural and Social Sciences.

Bass, B. M. (1997). Concepts of Leadership. In Vecchio R. P. (ed.). *Leadership: Understanding the Dynamics of Power and Influence in Organisations.* Notre Dame: University of Notre Dame Press.

Bass, B. M. (1999). Two decades of research and development in transformational leadership. *European Journal of Work and Organisational Psychology*, 8(1), 9-32.

Bass, B. M., Avolio, B. J., Jung, D. I & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology*, 88(2), 207-218.

Bennis, W. & Nanus, B. (1985). *Leaders: The strategies for taking change*. New York: Harper.

Bentler, P.M. & Bonett, D.G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, (88)3, 588 - 606.

Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, (107)2, 238 - 246.

Bollen, K.A. (1989). *Structural equations with latent variables*. New York: John Wiley and Sons.

Browne, M.W. & Cudeck, R. 1993. *Alternative ways of assessing model fit*. In K.A. Bollen and J.S. Long (Eds.). Testing Structural Equation Models. Newbury Park: Sage Publications.

Bryman, A. (1992). *Charisma and Leadership in Organisations*. London: Sage Publications Ltd.

Bycio, P., Hackett, R. D. & Allen, J. S. (1995). Further assessments of the Bass (1985) conceptualization of transactional and transformational leadership. *Journal of Applied Psychology*, 80, 468-478.

Byrne, B.M. (1998). Structural equation modelling with LISREL, PRELIS, and SIMPLIS: basic concepts, applications and programming. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Burns, J. M. (1978). *Leadership*. New York: Harper & Row, Publishers.

Chemers, M. M. (1997). *An integrative theory of leadership*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

Conger, J. A. & Kanungo, R. N. (1987). Toward a Behavioural Theory of Charismatic Leadership in Organisational Settings. *Academy of Management Review*, 12, 637-647.

Conger, J. A. & Kanungo, R. N. (1988). *Charismatic Leadership: The elusive factor in organizational effectiveness.* San Francisco, CA: Jossey Bass Publishers.

Conger, J. A. (1989). *The Charismatic Leader*. San Francisco: Jossey Bass.

Conger, J. A. & Kanungo, R. N. (1998). *Charismatic Leadership in Organisations*. Thousand Oaks, California: Sage Publications, Inc.

Conger, J. A. (1999). Charismatic and Transformational Leadership in Organisations: An insider's perspective on these developing streams of research. *Leadership Quarterly*, 10(2), 145-179.

Cotter, C. (2002). *Re-engineering South African Leadership: Awakening the leadership genius within yourself and your followers*. Retrieved April 04, 2005, from the World Wide Web: http://www.workinfo.com/free/Downloads/83.htm.

Day, D. V., Zaccaro, S. J. & Halpin, S. M. (2004). *Leader development for transforming organizations: Growing leaders for tomorrow.* Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

Den Hartog, D. N., Van Muijen, J. J. & Koopman, P. L. (1997). Transactional versus Transformational Leadership: An analysis of the MLQ. *Journal of Occupational and Organisational Psychology*, 70, 19-34.

Diamantopoulos, A. & Siguaw, J.A. (2000). *Introducing LISREL*. London, New Delhi: Sage Publications.

Doherty, A. J. (1997). The Effect of Leader Characteristics on the Perceived Transformational/Transactional Leadership and Impact of Interuniversity Athletic Administrators. *Journal of Sport Management*, 11, 275-285.

Downton, J. V. (1973). Rebel *Leadership: Commitment and Charisma in a Revolutionary Process*. New York: Free Press.

Du Toit, M. & Du Toit, S.H.C. (2001). *Interactive LISREL: user's guide*. Lincolnwood, IL: Scientific Software International.

Dvir, T., Eden, D., Avolio, B. J. & Shamir, B. (2002). Impact of Transformational Leadership of Follower Development and Performance: A Field Experiment. *Academy of Management Journal*, 45, 735-744.

Ferrando, P.J. & Lorenzo-Seva, U. (2000). Unrestricted versus restricted factor analysis of multidimensional test items: some aspects of the problem and some suggestions. *Psicológica*, 21, 301-323.

Filley, A. C., House, R. J. & Kerr, S. (1976). *Managerial process and organizational behaviour*. (2nd. Ed.). Glenview, III: Scott, Foresman.

Graen, G. & Cashman, J. F. (1975). A role-making model of leadership in formal organizations: A developmental approach. In J. G. Hunt and L. L. Larson (Eds). *Leadership Frontiers*. Kent, OH: Kent State University Press.

Hair, J. F., Anderson, R. E., Tatham, R. L. & Black, W. C. (1998). *Multivariate Data Analysis*. (5th ed.). Upper Saddle River, New Jersey: Prentice Hall, Inc.

Hater, J. J. & Bass, B. M. (1988). Supervisors' evaluations and subordinates' perceptions of transformational and transactional leadership. *Journal of Applied Psychology*, 73, 695-702.

Hayward, B. A., Davidson, A. J., Pascoe, J. B., Tasker, M. L., Amos, T. L. & Pearse, N. J. No Date. *The relationship between leadership and employee performance in a South African Pharmaceutical Company*. Retrieved April 12, 2005, from the World Wide Web: http://www.siopsa.org.za/conference/papers03.

Henning, R., Theron, C.C. & Spangenberg, H. H. (2004). The internal structure of the unit performance construct as measured by the Performance Index (PI). *South African Journal of Industrial Psychology*, 30(2), 26-36.

House, R. J. & Mitchell, T. R. (1974). Path-goal theory of Leadership. *Journal of Contemporary Business*, 3, 81-97.

House, R. J. (1977). A 1976 theory of charismatic leadership. In J. G. Hunt and L. L. Larson (editors). *Leadership: The Cutting Edge*. Carbondale: Southern Illinois University Press.

House, R. J., Spangler, D. & Woycke, J. (1991). Personality and charisma in the US Presidency: A psychological theory of leadership effectiveness. *Administrative Science Quarterly*, 36, 364-396.

House, R. J. & Podsakoff, P. M. (1994). Leadership effectiveness and future research direction. In G. Greenberg (ed.). *Organisational Behaviour: The state of the science*. Hillsdale, New Jersey: L. Erlbaum Associates.

House, R.J. (1995). Leadership in the twenty-first century. In A. Howard. (Ed). *The changing nature of work*, pp. 411-450. San Francisco: Jossey-Bass

House, R. J. & Aditya, R. N. (1997). The Social Scientific Study of Leadership: Quo Vadis? *Journal of Management*, 23(3), 409-473.

Hu, L.T. & Bentler, P.M. (1995). Evaluating model fit. In R.C. Hoyle (Ed.). *Structural equation modelling; concepts, issues and applications*. Thousand Oaks: Sage Publications.

Hull, J.G., Tedlie, J.C. & Lehn, D.A. (1995). Modeling the relation of personality variables to symptom complaints; the unique role of negative affectivety. In R.C. Hoyle (Ed.). *Structural equation modelling; concepts, issues and applications*. Thousand Oaks: Sage Publications.

Humphreys, J. H. (2001). Transformational and Transactional Leader Behaviour: The relationship with support for E-Commerce and emerging technology. *Journal of Management Research,* 1(3), 149-159.

Hunt, J. (1991). *Leadership: A new synthesis*. Thousand Oaks, CA: Sage.

Hunt, J. G. (1999). Transformational/charismatic leadership's transformation of the field. An historical essay. *Leadership Quarterly*, 10, 129-144.

Jöreskog, K.G. & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with SIMPLIS command language*. Chicago: Scientific Software International.

Jöreskog, K.G. & Sörbom, D. (1996a). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.

Jöreskog, K.G. & Sörbom, D. (1996b). *PRELIS 2: User's reference guide*. Chicago: Scientific Software International.

Jöreskog, K.G., Sörbom, D., Du Toit, S. & Du Toit, M. (2000). *LISREL 8: New statistical features*. Chicago: Scientific Software International.

Kelloway, E.K. (1998). *Using LISREL for structural equation modelling; a researcher's guide*. Thousand Oaks: Sage Publications.

Lowe, K. B., Kroeck, K. G. & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ literature. *Leadership Quarterly*, 7(3), 385-425.

Lussier, R. N. & Achua, C. F. (2004). *Leadership: Theory, Application, Skill Development*. (2nd ed.). Eagen, Min.: Thomsen South-Western.

MacCallum, R.C. (1995). Model specification: procedures, strategies and related issues. In R.H. Hoyle (Ed.). *Structural equation modelling; concepts, issues and applications*. Thousand Oaks, California: Sage Publications.

Maritz, D. 1995. Leadership and mobilizing potential. *Human Resource Management*, October, 8-16.

Marsh, H. W. & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First and higher-order factor models and their invariance across groups. *Psychological Bulletin*, 97, 562-582.

Mels, G. (2003). *A workshop on structural equation modeling with LISREL 8.54 for Windows*. Chicago: Scientific Software International.

Mullins, L. (1999). *Management and Organisational Behaviour*. London: Pitman Publishing.

Noe, R. A., Hollenbeck, J. R. Gerhart, B. & Wright, P. M. (1997). *Human Resource Management: Gaining a competitive advantage*. (2nd ed.). Chicago: The McGraw-Hill Companies, Inc.

Northouse, P. G. (1997). *Leadership: Theory & Practice*. Thousand Oaks, California: Sage Publications, Inc.

Northouse, P. G. (2004). *Leadership: Theory & Practice*. (3rd ed.). Thousand Oaks, California: Sage Publications, Inc.

Peters, T. & Waterman, R. (1982). *In Search of Excellence*. London: Harper Row.

Pillai, R. & Meindl, J. R. (1991). *The effects of a crisis on the emergence of charismatic leadership: A laboratory study*. Best Paper Proceedings, Annual Meeting of the Academy of Management, Miami, Fl, 420-425.

Pretorius, B. (2001). *Effective Leadership*. Retrived March 03, 2006, from the World Wide Web: http://www.managementtoday.co.za.

Robbins, S. P. (1996). *Organizational Behavior: Concepts, Controversies, Applications*. (7th ed.). Englewood Cliffs, New Jersey: Prentice-Hall International, Inc.

Saskin, M. (1988). The Visionary Leader. In J. A. Conger and R. A. Kanungo (editors). *Charismatic Leadership: The elusive factor in organizational effectiveness*. San Francisco: Jossey-Bass.

Schumacker, R.E. & Lomax, R.G. (1996). *A beginner's guide to structural equation modeling*. Mahaw, New Jersey: Lawrence Erlbaum Associates, Publishers.

Shamir, B., House, R. J. & Arthur, M. B. (1993). The Motivational Effects of Charismatic Leadership: A Self-Concept Based Theory. *Organisation Science*, 4(4), 577-594.

Shamir, B. (1995). Social distance and charisma: Theoretical notes and an exploratory study. *Leadership Quarterly*, 6(1), 19-47.

SHL. (2000). Competency design; towards an integrated human resource management system. *SHL Newsline*, March, 7-8.

SHL. (2001). Competencies and performance@work, *SHL Newsline*, May, 6.

Spangenberg, H. H. & Theron, C. C. (2002). Development of a uniquely South African Leadership Questionnaire. *South African Journal of Psychology*, 32(2), 9-25.

SPSS. (1990). *SPSS reference guide*. Chicago, Illinois: SPSS International.

Tabachnick, B.G. & Fidell, L.S. (1989). *Using multivariate statistics (Second edition)*. New York: Harper Collins Publishers.

Tejeda, M. J., Scandura, T. A. & Pillai, R. (2001). The MLQ revisited: Psychometrics properties and recommendations. *The Leadership Quarterly*, 12, 31-52.

Tepper, B. J. & Percy, P. M. (1994). Structural validity of the multifactor leadership questionnaire. *Educational and Psychological Measurement*, 54, 734-744.

Theron, C. C., Spangenberg, H. H. & Henning, R. (2004). An elaboration of the internal structure of the unit performance construct as measured by the Performance Index (PI). *Management Dynamics*, 13(2), 35-52.

Theron, C.C. & Spangenberg, H.H. (2005). Towards a comprehensive leadership - unit performance structural model: the development of second-order factors for the leadership behaviour inventory (LBI). *Management Dynamics*.,14(1), 35-50.

Tichy, N. M. & Devanna, M. A. (1986). *The transformational leader*. New York: John Wiley and Sons, Inc.

Tichy, N. M. & Devanna, M. A. (1990). *The transformational leader*. (2nd ed.). New York: Wiley.

Vroom, V, H. & Yetton, P. W. (1973). *Leadership and decision-making*. Pittsburgh, PA: University of Pittsburgh Press.

Waldman, D., House, R. J. & Ramirez, G. (1996). *The efficacy of distributed leadership in implementing change*. Unpublished paper, Australian Graduate School of Management, University of New South Wales.

Waldman, D., Ramirez, G. & House, R. J. (1996). *The effects of US CEO leader behaviour on firm profits under conditions of environmental certainty and uncertainty: A longitudinal* *investigation.* Working Paper, Regional Jones Centre for Strategic Management, Wharton School of Management.

Waldman, D. A., Bass, B. M. & Einstein, W. O. (1987). Effort, performance and transformational leadership in industrial and military service. *Journal of Occupational Psychology*, 60, 1-10.

Waldman, D. A., Bass, B. M. & Yammarino, F. J. (1990). Adding to Contingent Reward Behaviour: The Augmenting Effect of Charismatic Leadership. *Group and Organisation Studies*, 15(4), 381-394.

Wall, B., Solum, R. S. & Sobol, M. R. (1992). *The Visionary Leader*. Rocklin, California: Prima Publishing.

Warr, P. (Ed.). (2002). *Psychology at Work*. (5th ed.). England: Penguin group.

Weber, M. (1947). *The theory of social and economic organization.* (A. M. Henderson & and T. Parsons, Trans.). New York: Free Press. (Original work published in 1924).

Yammarino, F. J. & Bass, B. M. (1990). Long-term forecasting of transformational leadership and its effects among naval officers. In K. E. Clark and M. B. Clark (editors). *Measures of leadership*. West Orange, NJ: Leadership Library of America.

Yukl, G. A. (1989). *Leadership in Organisations*. (2nd ed.). Englewood Cliffs, New Jersey: Prentice Hall.

Yukl, G. (1994). *Leadership in Organisations*. (3rd ed.). Englewood Cliffs, New Jersey: Prentice Hall International, Inc.

Yukl, G. (1999). An evaluation of conceptual weaknesses in transformational and charismatic leadership theories. *Leadership Quarterly*, 10, 285-305.