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ABSTRACT

Adapting to change in a constantly changing environment is a challenge that organisations face on a daily basis. In order to stay competitive globally, the management of resistance to change becomes crucial. Research done on leadership reveals the very strong effect that leaders have on followers' behaviours and attitudes and it is emphasized the role leadership plays in the implementation and supporting of change. The purpose of this dissertation is to determine whether a relationship between leadership and resistance to change exist within the higher education sector.

The study obtains data of 75 participants within the faculty of engineering. The survey was done by means of a questionnaire. The statistical analyses included frequency analysis, descriptive statistics, reliability analysis, correlations, independent t-tests, Mann-Whitney tests, ANOVAs and Kruskal-Wallis tests.

Results indicated that employees' reactions toward change could be influenced by the type of leadership style present in the organisation, therefore it is necessary that the correct leadership style within an organisation cannot be underestimated. It could mean the difference between success and failure.

For the purpose of this study, the researcher considered the scales of the Resistance to Change questionnaire sufficiently reliable, but further exploration of the scales and its adaptation to this context may be needed in future to enhance reliability measures.

An important insight of this research is that, to be more effective in creating and supporting change within organisations, managers need to learn to recognise and understand resistance within them as well as in others.

This research contributes to the already vast content of research on leadership and resistance to change and does so by being focused on studying these constructs under a unique set of circumstances.

KEYWORDS

Transformational leadership, transactional leadership, resistance to change, routine seeking, emotional reaction, short term focus, cognitive rigidity.

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CHAPTER 1

ORIENTATION AND PROBLEM STATEMENT

1.1 Introduction

During times of change, leadership becomes an important factor. It is in these transforming times that leadership determines direction and moves organisations from where they are to where they need to be. Leaders make things happen (they shape culture), and they are revolutionaries: they face reality and mobilise appropriate resources and they encourage others to do the same (Tichy & Devanna, 1986:306).

Appelbaum et al. (2005:289) concludes that it is through leadership that employees are able to achieve management's ideal vision for the future organisation. The extent of the gap between the current state and the ideal state of the organisation can have an impact on the success of strategic organisational change. When the gap is very large, change efforts are likely to be frustrating and potentially devastating, because employees will perceive the change effort to be too threatening or impossible to achieve (Hitt et al., 1996:18-32). It is management's responsibility to manage the change effort in such a way that the gap between the current and future state is wide enough to challenge the organisation and not too wide to demoralise the change effort. Leaders must connect with the minds and hearts of their people; they must find simple and encouraging words to calm anxiety and maintain the trust needed to bring about lasting change.

This study will take a look at leadership through times of change, with special emphasis on the management of resistance to change. Adapting to change in a constantly changing environment is a challenge that organisations face on a daily

basis. In order to stay competitive globally, the management of resistance to change becomes crucial.

Resistance to change is defined by Kreitner and Kinicke (2008:545) as “an emotional/behavioural response to real or imagined threats to an established work routine”. Watson (1969) defines resistance as all the forces that contribute to stability in personality or in social systems. He further states that all these forces, from the perspective of a manager, may seem to be an obstruction. Changing the status quo, renewal and innovation within an organisation is management’s attempt to influence employees to behave, think or perform differently and more effectively. There are three possible influence outcomes with the implementation of change, namely resistance, commitment and compliance. Resistance to change especially represents a failed influence attempt.

Change involves going from the known to the unknown, and therefore resistance is a natural and normal response to change (Coghlan, 1993; Steinburg, 1992; Myers and Robbins, 1991; Nadler, 1981; Zaltman and Duncan, 1977). Many corporate change programme failures are directly attributable to employee resistance (Maurer, 1997; Spiker and Lesser, 1995; Regar et al., 1994; Martin 1975).

According to Floger (1999), employee resistance can be an enormous deterrent to effective organisational change. Change can generate skepticism and resistance in employees, making it very difficult - sometimes even impossible - to implement organisational improvements. The way people are treated and the way change is implemented can have a considerable influence on an employee’s resistance to change.

Leucke (2003) explained that most people eventually adapt and are reconciled to change, but not before passing through various psychological stages, namely: shock, defensive retreat, acknowledgement, and then adaptation. In some respects, these psychological stages resemble the grieving process a person

experiences after the loss of a loved one. Change readiness is automatic and it cannot be assumed. Failing to assess the readiness for change of organisations and individuals may result in managers spending significant time and energy dealing with resistance to change. By creating change readiness in organisations before attempts of renewal, resistance to change may be largely avoided (Smith, 2005:408-409).

People are creatures of habit and therefore individuals find it difficult to start doing things in a different way. Due to this factor, it is very important for managers to be able to manage resistance to change, as failed changes can further be very costly (Kreitner & Kinicke 2008:545). Many different reasons exist as to why individuals resist change, and will be discussed in detail later, in Chapter 2.

The purpose of this study is to explore the influence of leadership and the impact that leadership can have on resistance to change within the higher education sector.

1.2 Background to study

In the Higher Education Statistics Agency study, Griesel & Parker (2009) stipulated that the demands of the changing world of work will have a great impact on new graduates entering the workplace. This viewpoint emphasises the role higher education plays, by taking up its rightful place in producing thinking, responsive and intellectually well-grounded individuals, who are flexible and can readily adapt to new demands and challenges.

Grasso and Burkins (2010) stated that the rapid changes in the global economy led to increasing concerns about energy and environmental issues. They further conclude that “we live in a time of great change, in an increasingly global society, driven by the exponential growth of new knowledge and knitted together by rapidly evolving information and communication technology”. The overall implications of a technology-driven global economy are particularly profound within engineering practices. New technologies, as well as the complex mega

systems, require interdisciplinary engineering teams with a wide intellectual span, rather than a focused practice within traditional disciplines.

The above mentioned factors emphasise the change in the higher education environment, especially engineering. The main concern - and the focus of this study - remains the methods of facilitating change in such a manner that the change is not resisted by the employees in the faculty. The other question that comes to mind is which leadership style to choose when facilitating this change process, in order to successfully reach the specified outcomes at the end. Lastly, what is the impact of leaders on the change process?

Change is unavoidable and can be very uncomfortable for the employees, as well as management. Because it is uncomfortable, most people tend to resist change. One of the most critical responsibilities of an effective leader is to reduce people's resistance to change in order to promote growth in the organisation (Richards, 2011).

"Any alteration of activities in an organisation is considered organizational change" (Carson, 1999:154). Leadership of an organisation can unknowingly create barriers to change, when strategies are installed that undermine corporate values without providing the visionary support for the transition. According to Deal and Kennedy (2000:175), "the force of the old culture can neutralize and emasculate a proposed change".

With these aspects in mind, a thorough literature study will be done in Chapter 2, with an emphasis on resistance to change and how it can be managed through leadership.

1.3 Problem Statement

The Faculty of Engineering at the North-West University has been experiencing the forces of change within the Educational sector, that have been impacting on factors ranging from poor performance, de-motivated staff, poor communication, negativity, schools operating in silo's without synergy, and adaption problems to new processes and systems.

In his research on the impact of change within the educational sector, Bok (2006) found that, when change is proposed in most faculties, individuals fear loss, even if they cannot determine exactly what they might lose. Because they are highly educated and articulated, they will need to resolve the cognitive dissonance, to rationalise their fear by giving arguments against the proposal for change.

This study will explore the influence leadership has on the change process, and particularly on resistance to change in a constantly changing environment, within the faculty. An investigation will be done on academic as well as support staff within the Faculty of Engineering at the North-West University Potchefstroom Campus, to see which leadership styles exist and what their relationships are towards resistance to change.

Rath (2004) stated in his article "The Impact of Positive Leadership" that positive leaders deliberately increase the flow of positive emotions within their organisations. They choose to do this for the sake of improving morale, but also because it leads to a measurable increase in performance. Studies have shown that organisational leaders who share positive emotions have workgroups with a more positive mood, enhanced job satisfaction, greater engagement and improved performance.

1.4 Objectives of the study

The aim of this study will be to measure the relationship between leadership and resistance to change. The objectives of this study will be split into primary and secondary objectives.

1.4.1 Primary objectives

The primary purpose of the study is to establish whether there is a relationship between the leadership style and the level of resistance to change related to that specific leadership. The focus will be on the relationship between Transformational leadership and resistance to change as well as Transactional leadership's relationship to resistance to change.

The research will further explore the relationship between the staff members' different positions and their resistance to change, as well as between the school's resistance to change and their leadership orientation.

1.4.2 Secondary objectives

The secondary purpose of this research will be to:

i) Conduct a literature study to determine the extent of research on these aspects.

ii) To determine the resistance to change between academic and support staff.

iii) To determine what the leadership orientation is in each school in the faculty.

iv) To determine the level of resistance to change between the schools in the faculty.

v) To determine whether leaders can reduce resistance to change.

1.5 Scope and demarcation of the study

The research will be done within the discipline of leadership and change management in the Potchefstroom region, within the Higher Education sector, namely the North-West University, of which a total population of 100 employees was studied.

1.6 Research methodology

1.6.1 Literature/theoretical study

A literature study will be done to determine the extent of research on this topic. This research study will primarily focus on previous research done on various leadership theories, especially the theories that are most suitable for implementing change in an organisation. The aspects of

change will be looked at, as well as which factors exist in stimulating resistance to change within the change process.

Preliminary research has already revealed some previous studies that show a relationship between leadership styles and resistance to change. Lacking in this study was studies done on leadership styles and resistance to change in an Engineering education environment.

Sources to be used include scientific journals, as well as various handbooks. Electronic searches were also done, using scientific database search engines including EbscoHost and ScienceDirect.

1.6.2 Empirical study

This study will follow the quantitative tradition. Existing questionnaires were used, namely the Management Orientation Questionnaire (Coetsee, 2011) and the Resistance to change Questionnaire (Oreg, 2008).

The Management orientation questionnaire consists of 12 pairs of statements; within each pair the respondents should rate the statements that describe their views best. Every item should divide five points between statements A and B.

The Resistance to Change questionnaire (Oreg, 2003) was designed to measure an individual's dispositional inclination to resist change and was measured on a six point likert scale (strongly disagree, disagree, inclined to disagree, inclined to agree, agree, and strongly agree).

1.6.3 Study population

The group being studied consisted of the whole population of the Engineering faculty at the North-West University, Potchefstroom Campus.

Permission was obtained from the Dean of the faculty, as well as the various school directors. The school directors handed out the questionnaires personally to each employee in their particular schools. A

cover letter assuring anonymity was included. Participation was completely voluntary. The choice of demographics was specifically made in a way that ensures anonymity. The time it would take to complete the questionnaire was also indicated (approximately five minutes). The participants were given five days to complete the questionnaire and return it to the various secretaries within the schools, where they posted their questionnaires in a sealed box. The questionnaires were handed over to statistical consultation services, which captured the information and did the statistical analysis from the received questionnaires.

This statistical analysis was used to determine the relationship between the constructs with the computer packages SPSS (2009) and Statistica.

1.7 Added value of this study

The focus and findings of this study could prove to contribute significantly to the way change is handled within the faculty, by using the correct leadership style to facilitate change in a constantly changing environment.

Within this study, the researcher looks at the reasons why people resist change, as well as how they resist change. The level of resistance to change and the type of leadership will be looked at within the faculty of engineering, and suggestions will be made on how to manage it in such a way that effectiveness and efficiency within the faculty can be reached, by influencing employees to accept the changes necessary to adapt to the constantly changing environment they are exposed to.

1.8 Limitations of the study

For the purpose of this study, the researcher considered the scales of the Resistance to Change questionnaire sufficiently reliable, but further exploration of the scales and its adaptation to this context may be needed in future, in order to enhance reliability measures. The second limitation is that a convenience sample of staff in the faculty was drawn, which does not allow for statistical inference to the population (i.e. all staff in the faculty). The group in this study

belonged to a single faculty of a particular university. Results and conclusions from this study are not necessarily applicable to other contexts.

In chapter 2, the researcher scrutinised as much of the literature on leadership, change and resistance to change as she could find. Special attention was paid to the type of leadership style, to facilitate the change process and to see which type of behaviour will minimise resistance to change.

CHAPTER 2

LITERARY REVIEW

The objective of this chapter is to explore the literature on the concepts of leadership and the influence thereof on change and resistance to change. To begin with, leadership theories and leadership styles will be discussed, after which the change process and resistance to change will be looked into.

2.1 Introduction

In these turbulent times of constant change in the 21st century, leadership has become a subject of debate frequently taken up in literature. Leadership and the absence of leadership can have a dramatic effect on organisations. Without leadership, organisations move too slowly, stagnate and lose their way. Mills (2005) emphasises decision making and implies that, when decision making is timely, complete and correct, everything will go well. After the decision making phase, organisations face the problem of implementation. Implementation problems are really issues of how leaders influence behaviour, change the status quo and overcome resistance to change.

For organisations to adapt to the turbulent environment, change has become synonymous with standard business practices, as strategies are reformulated on a constant basis (Appelbaum et al., 1998). At the same time, organisations are confronted with the widespread notion that people do not want to change. Psychological and management literature in general describe resistance as a given, or even natural, psychological response to change (Gravenhorst, 2003). Dent & Goldberg (1999) defined resistance to change as "behaviour which is intended to protect an individual from the effects of real or imagined change". Zaltman & Duncan (1977) also defined resistance as "any conduct that serves to maintain the status quo in the face of pressure to alter the status quo". In the view of Folger & Skarlicki (1999), resistance to change is defined as the behaviour of employees that seeks to challenge, disrupt, or invert prevailing assumptions, discourses and power relations.

Taking all of the above definitions into consideration, one can conclude that leadership is all about influence, persuasion and enabling a group to engage together in the process of developing, sharing and moving into a vision, and then living it out. Resistance to change, on the other hand, is all about the actions of people to keep the status quo against altering the status quo. People also try to protect themselves against imagined effects of the proposed change.

If management do not understand or make an effort to work with resistance, they could undermine the most well-intentioned change efforts (Folger & Skarlicki, 1999).

2.2 Leadership theories

As background to the study, a brief summary and discussion of relevant leadership theories are given.

2.2.1 Trait Theory

This approach evolved out of the Great Man Theory as a way of identifying the key characteristics of successful leaders. Through this approach, it was believed that critical leadership traits could be isolated and recruitment of people with these traits could be done so that they can be appointed into certain leadership positions. This approach was very commonly used in the military.

The problem with this approach was that several studies were undertaken and as many traits were identified. The traits identified were not consistent.

2.2.2 Behaviourist Theory

The research on this theory started during World War II as part of an effort to develop better military leaders. This research was an outgrowth of the seeming inability of the trait theory to explain leadership effectiveness. The focus of this leadership theory was on leader behaviour instead of personality traits. It was believed that the leader's behaviour had a direct effect on group effectiveness. This led researchers to identify behaviour patterns that enabled leaders to influence others effectively (Kreitner & Kinicke, 2008).

2.2.2.1 McGregor's Theory X & Y

The most published concept of McGregor is that leadership strategies are influenced by leaders' assumptions about human nature. McGregor summarised two contrasting groups of assumptions:

- Theory X managers believe that:

  i) Most people have a dislike of work and will avoid it if possible.

  ii) Most people must be controlled, directed or threatened with punishment to get them to achieve organisational objectives.

  iii) A person prefers to be directed, wants to avoid responsibility, has little ambition and wants security above anything else.

- Theory Y managers believe that:

  i) Effort in work is as natural as play or rest and that people learn not only to accept but to seek responsibility.

  ii) People will exercise self-control and self-direction to reach objectives they are committed to.

  iii) People have the capacity of a relatively high level of imagination, ingenuity and creativity in the solution of organisational problems and intellectual potentialities are underutilised under conditions of modern industrial life (McGregor 1960).

Therefore, we can say that a leader holding Theory X assumptions would prefer an autocratic style, where Theory Y assumption leaders would prefer a participative style.

2.2.2.2 Blake and Mouton's Managerial Grid

The Blake and Mouton managerial grid focuses on production and people orientation of managers (Zeidan, 2009).

The grid plots five basic leadership styles, namely:

i) Country Club Management – High concern for people.

ii) Impoverished Management – Low concern for people and low concern for production.

iii) Authority Obedience – High concern for production and low concern for people.

iv) Organisation Management – Moderate concern for people and a moderate concern for production.

v) Team Management – High Concern for people and a high concern for production. This management style was seen as the most effective type of leadership behaviour.

2.2.3 Contingency-Situational Leadership

Contingency-situational theories were developed to indicate that the style to be used is contingent upon such factors as the situation, the people, the task, the organisation and other variables (Gosling et al., 2001). A good situational leader is one that is flexible enough to change his/her leadership style as the situation deems necessary (Walters, 1999:10).

The most important theories that contributed to the contingency-situational theory will be described below.

2.2.3.1 Fiedler's Contingency Model

Fiedler's contingency theory highlights that there is not a single best way for managers to lead. Different situations will create different requirements for the manager's leadership style. In highly routine or mechanistic environments where repetitive tasks are at the order of the day, a relatively directive leadership style may contribute to the best performance, but in a more dynamic environment a more flexible, participative style may be required (Fiedler 1967).

Fiedler defined the conditions of a managerial task within three situations:

i) Leader member relations

ii) Task structure

iii) Positioning power

A rating was done, based on the manager's relationship orientation or task orientation. Task oriented managers do better in situations that have good leader-member relationships, structured tasks and either weak or strong position power. The leader-member relations, task structure and position power also dictate a leader's situational control in the contingency model theory. In favourable relationships, the manager has a high task structure and is able to reward or punish employees without experiencing problems. In unfavourable relationships, the manager's task is unstructured most of the time and the leader has limited authority.

Positioning power, on the other hand, measures the power or the authority the specific manager perceives he has been given for the purpose of directing, rewarding or punishing subordinates. Positioning power depends on the taking away or increasing of the decision making power of employees.

Task-motivated leaders experience pride and satisfaction in task accomplishment for the organisation, where relationship-motivated leaders seek to build interpersonal relations and extend help for team development in the organisation. Task-motivated leaders perform at their best when the group performs successfully, for example when new sales records are achieved or when major competitors are outperformed. Relationship-oriented leaders perform at their best when greater customer satisfaction is reached and when a positive company image is established.

2.2.3.2 The Hersey-Blanchard Model of Leadership

According to Bolden et al. (2003), the Hersey-Blanchard Model of leadership also follows the situational perspective of leadership. This model emphasises that the developmental levels of a leader's subordinates play the greatest role in determining which leadership style is the most appropriate. This theory is built on the amount of

direction and socio-emotional support a leader must provide, based on the maturity level of their followers.

The Hersey-Blanchard model divides leader behaviours into two groups, namely directive behaviour and supportive behaviour. Behaviours included in the directive group are one-way communication, communication of followers' roles and the close supervision of performance. In the supportive group, behaviours include two-way communication, listening and the provision of support and encouragement, as well as the facilitation of interaction by the followers.

For this model, the key variable then determining the correct leadership style is the readiness or developmental level of the subordinates. Blanchard identified four leader styles:

- Directing
- Coaching
- Supporting
- Delegating

Before identifying the appropriate leadership style to use, the maturity level of the followers should be determined, according to the specific task. As followers' maturity increase, the leader should reduce his task behaviour and increase relationship behaviour until followers reach their moderate maturity level. As soon as followers begin to move into an above average level of maturity, the leader should decrease task behaviour as well as relationship behaviour. As soon as the maturity level is identified, the appropriate leadership style can be determined.

2.2.3.3 Tannenbaum & Schmidt's Leadership Continuum

Contingency theorists Tannenbaum and Schmidt (1958) came forward with an idea that leadership behaviour varies along a continuum and the moment that one moves away from autocratic, the amount of subordinate participation and involvement in decision making increases. These two theorists also suggested that the kind of leadership

represented by democratic extremes of the continuum will not often be encountered in formal organisations.

Four leadership styles can be located along this continuum:

i) Autocratic – The leader takes the decisions, announces them and expects subordinates to carry them out without question. (Telling style.)

ii) Persuasive – Here the leader takes all the decisions for the group without discussion and believes that people will be better motivated if they are persuaded that the decisions are good ones. (Selling style.)

iii) Consultative – In this style the leader confers with group members beforehand and does not take any decisions without considering their feelings or advice. Decisions and responsibility remains with the leader, but the degree of involvement by followers in decision taking is much greater. (Consulting style.)

iv) Democratic – At this point on the scale, the leader would characteristically lay the problem before the followers and invite discussion. This leader will allow the decision to emerge out of the discussion process instead of imposing it on the group. (Joining style.)

2.2.3.4 Adair's Action-Centered Leadership Model

Adair (1973) has a long pedigree in the world of leadership. Within this leadership model, the action-centered leader gets the job done through work teams and their relationships with fellow managers and staff.

According to Adair, the following is of great importance for the leader:

- Direct the job to be done (task structuring).
- Support and review the individual people doing it.
- Co-ordinate and foster the work team as a whole.

John Adair's three circle diagram is a simplification on the variability of people's interaction with each other. The leader carries out the functions and displays the

behaviours depicted by the circles. Situational and contingent elements ask for different responses by the leader. Note that the various circles may be bigger or smaller as the situation changes. The challenge for the leader is to manage all sectors of the diagram, such as:

- Task – Define the task, make the plan, allocate work and resources, control quality and rate of work and adjust the plan.
- Team – Maintain discipline, build team spirit, encourage, motivate and give sense of purpose, appoint sub-leaders, ensure communication within the group and develop the group.
- Individual – Attend to personal problems, praise individuals, give status, recognise and use individual abilities and develop the individual.

2.2.4 Transactional leadership

Transactional leadership is an exchange process based on the fulfillment of contractual obligations and is typically represented as setting objectives and monitoring and controlling outcomes. Transactional leadership is comprised of the following three first order factors:

a) Contingent reward leadership refers to the behaviours of leaders and their focus on clarifying role and task requirements and providing followers with material rewards contingent on the fulfillment of contractual obligations.
b) Management by exception (active) refers to the active vigilance of a leader whose goal is to ensure that standards are met, and
c) Management by exception (passive) leaders intervenes only after noncompliance has occurred, or when mistakes have already happened (Antonakis et al., 2003).

Transactional leaders define and communicate the work that must be done, how it will be done and the rewards their followers will receive for completing the stated objectives (Meyer & Botha, 2000). This leadership style comes into action when leaders approach their followers to correct a problem, or to arrange an agreement that will lead to better

results; they also make work behaviour more instrumental for followers to reach their own existing goals, while concurrently contributing to the goals of the organisation (Brand et al., 2000).

Transactional leadership remains the organisational model for many people and organisations that have not moved into or encouraged the transformational role needed to meet the challenges of our changing times (Bolden et al., 2003).

2.2.5 Transformational leadership

Transformational leadership is an energetic management style that allows leaders to motivate employees through various methods. These leaders move and work among staff members and move employees forward with inspirational words and actions. Through this kind of management style, employees develop a stronger sense of confidence in the company and employees work harder to achieve company goals (Anderson, 2011). Transformational leadership focuses on the followers, motivates them to achieve a higher performance level and helps develop the leader within each individual (Kendrick, 2011).

High levels of transformational leadership have a great impact on followers by increasing job satisfaction, motivation, innovative capabilities, accountability, improved self-esteem, improved performance, lower absenteeism, and reduced work related stress (Carss, 2010).

Transformational leaders can achieve exceptional performance by stimulating innovative ways of thinking and changing followers' beliefs and aspirations. These leaders can see the importance of change, have vision and can marshal commitment to that specific vision, to support the required changes. Effective communication is the main tool used by transformational leaders to promote self-confidence and inspire trust within their teams. The transformational leadership style can result in a relationship of mutual stimulation and provide support to develop leadership skills in various levels of staff (Burns, 1978). Transformational leadership leads to higher levels of performance than can be produced by transactional leadership (Bass, 1985). A high level of

consistency has been found between transformational leadership styles and employee motivation; the research demonstrates higher levels of employee effectiveness as well as greater employee and customer satisfaction in comparison with non-transformational leadership styles (Curtis & Connell, 2011). Transformational leadership emphasises the value of shared accountability, responsibility and power, and the empowerment of employees, to help leaders and managers achieve organisational goals.

The Bass (1998) theory of transformational leadership has five main components, which are:

- **Idealised influence** (leaders are admired and respected by those they lead).

  Leader Behaviour

  These leaders communicate the importance of values and beliefs, stipulate the importance of having a strong sense of purpose, and consider the moral and ethical consequences of decisions, champion exciting new possibilities and communicate the importance of trust.

- **Inspirational motivation** (leaders inspire others with a team spirit and enthusiasm for the work at hand).

  Leader behaviour

  They are optimistic about the future and what needs to be accomplished, articulate a compelling vision for the future, show confidence that goals will be achieved, present exciting images of the important aspects to consider and take a stand on important issues.

- **Intellectual stimulation** (created by leaders with problem-solving skills, creativity and the capacity to advance knowledge or practice).

Leader behaviour

These leaders seek different solutions when solving problems, involve others to take a look at problems from different angles, encourage out of the box thinking and questioning of issues never questioned before.

- **Individualised consideration** (leaders' skills are supportive of individuals' needs. These leaders provide mentorship to support and encourage staff to develop and advance their careers).

Leader behaviour

These leaders invest time in teaching and coaching; treat others as individuals and not just as members of a group, and look at individuals as having different needs, abilities and aspirations as other individuals. They help develop others' strengths, listen to their suggestions and concerns, and encourage self-development.

- **Idealised attributes** (respect, trust and faith).

Leader behaviour

They instill pride in others for being associated with them and earn respect in the way they do things. These leaders display competence and a sense of power; they make personal sacrifices to benefit others and assure others that obstacles will be overcome (Bass & Avolio, 1994).

Tichy & Devanna (1986) came across certain characteristics in their research which, according to their estimation, differentiate transformational from transactional leaders. The following factors came to light:

- Change agent's qualities. Transformational leaders create adaptive, innovative, entrepreneurial and flexible organisations.

- Courage. Transformational leaders are ready and able to take a risk and face the status quo in the organisation. These leaders' intellectual abilities enable them to face the reality, even though it is not pleasant.
- Openness and faith in their followers. Within their relationships with their followers, they are open and sincere, and ready to give confidence when required. Transformational leaders are sensitive with regard to their followers and they do their best to empower them.
- Led by values. Transformational leaders have the ability to formulate essential values, and show behaviour which is in accordance with these values.
- Life-long learning. These leaders also draw lessons from their own experiences, which enable them to be ready, when necessary, to perform make radical changes in their own attitudes, approach and behaviour to certain situations.
- Ability to face complex, ambiguous and uncertain situations. Transformational leaders are ready to face almost every situation they find themselves in. Taking into consideration the complexity and uncertainty of conditions and situations in which organisations are almost daily, the ability of successful ingenuity in such conditions is of extreme importance.
- Visionary abilities. Transformational leaders are extremely good visionaries. They have the ability to create a future state, and communicate it successfully to their followers.

Parry (1996) adds one more ability to this list, namely managerial ability. While anybody can be a transactional leader, a transformational leader is the only one who can be a good manager too, at the same time.

Applying these attributes in the process of organisational transformation, transformational leaders are allowed to embed the awareness of necessity of the organisational transformation process, to successfully bring the process to an end. Both the organisation and the employees will profit from that action.

A closer inspection will be made of Transactional leadership and Transformational leadership. Transactional leadership has remained the organisational model in many

organisations, because of the need for transformational leaders to meet the challenges in our constantly changing times (Bolden et al., 2001).

One of the problems leaders are continuously confronted with is the fact that the business environment is constantly changing. As long as companies grow, change is part of the process. Change is important for any organisation, because businesses would likely lose their competitive edge and fail to meet the needs of their customers if they do not adapt to change (Richards, 2011).

Change is unavoidable, but it can also be very uncomfortable for the employees as well as management. Because it is uncomfortable, most people tend to resist change. One of the most critical responsibilities of an effective leader is to reduce people's resistance to change, in order to promote growth in the organisation (Richards, 2011).

Firstly, the researcher will take a look at the change process, followed by factors influencing the change process and why resistance to change is experienced.

2.3 The change process

Change in higher education has been caused by drastic alterations in the traditional boundaries of our nation's universities. Age patterns of the past, ethnicity, academic interest and pre-college preparation are unrecognisable today. Campus missions have broadened to be more responsive to demands and expectations of their clients (Ringel, 2000).

According to Lane (2007), nothing seems to strike individuals as much, emotionally and professionally, as the phrase "change is coming". Dramatic changes in one's daily patterns are always very stressful and threatening. To cope with constant change is now a key requirement for success in life and work.

Before an understanding can be reached on why and how people resist change, it is of the utmost importance to understand organisational change. According to Renee Hanson (2003), change occurs when something new starts or something old stops, and it takes place at a particular point in time. Change often starts with a new beginning, but transition must start with people letting go of old attitudes and behaviours. Van Schoor

(2002) developed a model that shows the different forms in which change occurs in the organisation:

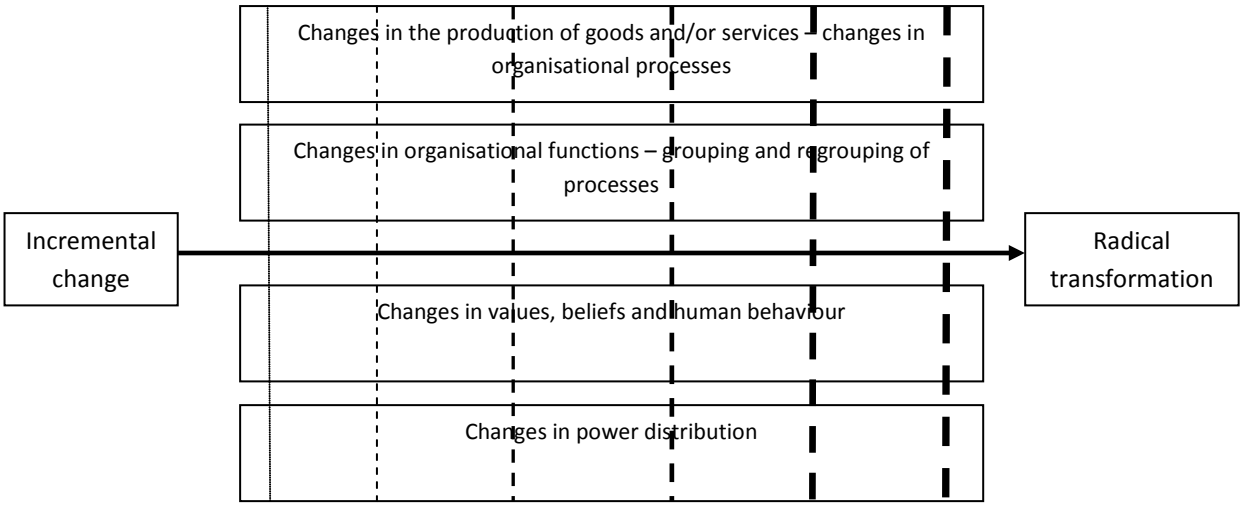


Figure 2.1: Forms of organisational change (Van Schoor, 2001).

Van Schoor's model shows the impact of change from incremental change (systematic impact) at the one end of the continuum, to a very intense radical transformation (intense systematic impact) at the other end (Dehler & Walsh, 1994).

Between the two extremes, various impact levels are experienced, as indicated by the dotted lines that increase in intensity from left to right. The more profound the changes, the stronger the resistance will be.

Cao et al. (2000) discuss the four broad areas in which the change can occur. First of all, there is a change in organisational processes that may result from technological innovation, for example the internet. Secondly, the grouping or regrouping of processes may result from external demands. For example, the political imperatives to restructure higher education in South Africa. The third area is the change in values, beliefs and human behaviour, which may lead to a new organisational vision. Lastly, a change in focus may bring about a change in power relationships that usually happens in organisational restructuring (Van Schoor, 2001).

2.3.1 Why is change so difficult?

In his article “The cluttered mind uncluttered” (2009), Taylor mentions the following obstacles that prevent people from changing:

- Good things as well as not-so-good-things are brought into adulthood from an individual’s childhood, commonly referred to as “baggage”. These could include low self-esteem, perfectionism, and the fear of failure, need for control, anger or the need to please. This baggage can cause an individual to think, feel and behave based on who they were as a child. It can further cause individuals to react in a defensive way that can sabotage efforts to achieve success.

- Deeply ingrained habits in the way of thinking, the experience of emotions and the way the individual behaves arise out of this baggage. To state it more clearly, individuals react to the world in a certain manner, because that’s the way they always did; these habits produce unacceptable reactions that are no longer healthy or adaptive.

- People do not make an effort to change because of negative emotions that they are experiencing, for example fear, anger, sadness or frustration.

- Individuals create environments for themselves to help them best cope with their baggage, habits and emotions. The people they surround them with and the activities they participate in give them a sense of comfort and security. Unfortunately, this environment may not support change or, at worst, even discourages it.

2.4 Resistance to change

Resistance can be irrational and self-serving. But, it is a very important form of feedback and should not be dismissed, because it will rob the leader of a very powerful tool when implementing change. A strong leader is needed to step up and engage when a change effort meets with pushback. Perspective could be gained when paying attention to, understanding and learning from the behaviour of others that the leader may perceive as threatening, which will empower the leader to ultimately deliver better

results (Ford J.D. & Ford L.W., 2009). A very important concern for many organisations is to understand employees' reactions to a planned organisational change. The change process can be severely hampered by resistance to change and has been associated with negative outcomes such as decreased satisfaction, productivity, and psychological well-being, as well as increased theft, absenteeism and turnover. Research by Oreg et al. (2008) tied employees' reactions to change to characteristics of the change process, such as management's provision of information concerning change and the extent to which employee participation is enabled. Characteristics such as leadership and organisation climate will likely affect the way change is implemented and, consequently, how employees react to change (Dam et al., 2008). The understanding of how characteristics of the daily work context impact employees' reactions to change is of the utmost importance. Resistance to change by employees could potentially be prevented by better preparation for upcoming changes and by paying attention to aspects of the daily work situation that cause problems. It is critical for the success of change efforts that employees' reactions to change are considered; it can prevent change from developing, while at the same time it may enhance employees' psychological well-being (Bordia et al., 2004; Fugate, Kiniciki & Scheck, 2002). Employee acceptance of change is enhanced by characteristics of the change process (Oreg, 2006); this statement is emphasised in the current thinking of change management.

To be more effective in creating and supporting change within organisations, managers need to learn to recognise the manifestations of resistance in themselves as well as in others (Kreitner & Kinicke, 2008). Eleven reasons why people resist change are discussed by Kreitner & Kinicke (2008):

i) Individuals' predisposition towards change. This predisposition is highly personal and deeply ingrained; it is an outgrowth of how individuals learn to handle change and ambiguity as children.

ii) Fear and surprise of the unknown. The moment when innovative or radically different changes are introduced without any warning, employees affected by this will become fearful of the implications thereof.

iii) Climate of mistrust. Un-devoted faith in others' intentions and behaviour are factors that are involved in trust. Managers with great trust in their employees make the change process an open, honest and participative affair. Employees who trust their managers are more willing to put in extra effort and take chances with something different.

iv) Fear of failure. When changes on the job are very intimidating, it can cause employees to doubt their own capabilities.

v) Loss of status or job security. When changes in the administrative and technology arenas threaten to alter power bases or eliminate jobs, it generally triggers strong resistance.

vi) Peer pressure. People who are not directly affected by change may also be actively resistant to change to protect the interest of their friends and co-workers.

vii) Disruption of cultural traditions or group relationships. Group dynamics are thrown into disequilibrium whenever individuals are transferred, promoted or reassigned.

viii) Personality conflicts. Personalities of change agents can breed resistance, just as a friend should rather tell us something we would not like to hear from a stranger.

ix) Lack of tact or poor timing. The introduction of change in an insensitive manner or at an awkward time can cause undue resistance. Organisational change can be more likely accepted when managers effectively explain or sell the value of the proposed change.

x) Non-reinforcing reward systems. When individuals do not foresee positive rewards for changing, they will resist change.

xi) Past success. Past success can breed complacency, but it can also foster a stubbornness to change, because people believe that what worked in the past will work in the future.

Van Schoor (2001) expands on this by exploring the reasons why people resist change. According to him, change implies loss that is a very emotional experience, which can be associated with stress and anxiety. Emotional reactions to change are very similar to the experience of grief (Carr, 2001; Elrod II & Tippett, 2002).

First people deny change, then they resist it, and then the stage is reached where they explore new options and fully commit to them (Bovey & Hede, 2001). This sequence shows that resistance is a process-oriented phenomenon and not a once-off event that can be dealt with.

The reason why people resist change is because they experience a loss of identity, belonging, meaning (Strickland, 2000) and mastery (Moran & Brightman, 2001). When the setting of a job is changed, teams are broken up, relationships that have been developed over time are dissolved and a loss of belonging occurs. This typically happens in mergers. Particularly devastating for individuals are when a loss of meaning occurs; this happens when the occupational values that have sustained individuals over time are changed when two groups with distinctly different cultures are integrated. A loss of mastery occurs when the job content changes to such an extent that new skills have to be learned in order to perform the job properly (Van Schoor, 2001).

Trader-Leigh (2002) identified specific factors that contribute to change resistance. They are:

- Self interest – Refers to the way people see the change as harmful in one way or another.
- Psychological impact – Refers to the perceived impact of the change on individuals' job security, professional expertise and social status in the organisation.
- Tyranny of custom – Refers to the tendency to be caught up in the web of tradition.

- Redistributive factor – People resist change because they will stand a chance to lose all of their privileges when redistribution of tasks and responsibilities occur.
- Destabilisation effect – This point to the introduction of new people into the organisation that are not familiar with the organisation's culture and operations. This specific change will be resisted very strongly.
- Culture incompatibility – Refers to the clash between, for example, academic- and business-oriented cultures, which will also be resisted.
- Political effect – Refers to the power relationships in the organisation and the degree to which they are threatened.

2.4.1 How do people resist change?

According to Trader-Leigh (2002), the most obvious form of resistance to change is to retain the status quo. To withhold information or filter the information is one of the most subtle and effective forms of resistance. Followers can sink the change process or use it to their own advantage by controlling the flow of information.

Retaining the status quo and filtering information are conscious acts; however, unconscious acts and maladaptive defense mechanisms like particular projection play a significant role in resisting change too. Projection signals a reluctance to take responsibility for one's decisions and circumstances. Humour and anticipation are typically adaptive defense mechanisms that can facilitate change, because they imply a sense of control. Humour is the most change-facilitative and refers to the ability to see reality in a different light (Bovey & Hede, 2001). The only way to deal with change is to approach it very systemically. Further discussion on this statement will take place later in this chapter.

2.5 Influence of leadership styles on resistance to change

Characteristics of the change process do not operate in a vacuum. The characteristics evolve from the daily routine within which organisations function. Dirks & Ferrin (2002) suggest that the characteristics of the daily routine, such as leadership and perceived climate, are linked with employees' reactions to the change through their influence on

the change process. Research done on leadership reveals the very strong effect that leaders have on followers' behaviours and attitudes. The leadership role is emphasised in the implementation and supporting of change (Whelan-Berry et al., 2003). Bartunek et al. (2006) considered the strong impact leaders have on the organisational phenomena and they considered the key role employees' reactions play in determining the success of organisational change. To link these two will be particularly meaningful in considering a leader's role in shaping employees' reactions to change. Values influence individuals' interpretations of events, attitudes, as well as choices and behaviours (Oreg, 2008). For instance, where individuals value stability they may interpret an organisational change as a threat and therefore resist it, where those who value stimulation and renewal may interpret change as an opportunity and will therefore be more likely to support it. The values of leaders have a significant influence on the goals they assign and the outcomes they reward and punish. For instance, when leaders who value stimulation and openness to new ideas encourage followers to exhibit greater risk taking, it will accordingly reward innovative and unconventional ideas. Organisational policies and norms are shaped by the leaders' values, and come to influence employee attitudes (Oreg & Berson, 2011). Followers look up to their leaders under conditions of change, as a source of certainty, and may thus be more attentive to their guidance and actions. Oreg & Berson (2011) expected that employees' reactions to organisational change will reflect their leaders' personal orientation towards change. To be more specific, when the leader of the organisation values stability, the employees are more likely to exhibit greater intentions to resist change than employees of a leader emphasising novelty and renewal (Oreg & Berson, 2011). One aspect that specifically focuses on individuals' orientation towards change is the concept of dispositional resistance to change (Oreg, 2003). Dispositional resistance to change is more likely to influence how organisational members respond to specific change situations and to the choices they make in the context of change. Through the emphasis and guidelines leaders provide, their dispositional orientation towards change will be reflected in the organisation's employees. This is very similar to the process that was described for values; for instance in cases where dispositional resistant leaders are more likely to encourage and reward strict maintenance routines, and discourage new ideas and change initiatives. These leaders will be signaling the

positive value of consistency and stability and the negative value of change. Over a period of time, this signaling is very likely to instill a negative orientation towards change among followers (Oreg & Berson, 2011).

2.5.1 Influence of transformational leadership on resistance to change

Employees' reactions towards change can be influenced by Transformational Leadership behaviours through a number of routes. By offering a compelling vision of future changes in the organisation, transformational leaders can stimulate and inspire followers. They use intellectual stimulation and challenge employees to accept innovative solutions to problems and to challenge the status quo (Berson & Avolio 2004). The impact of transformational leaders on followers is expected to be positive when talking about the followers' reactions to organisational change (Bass & Riggio, 2006; Groves, 2005). Several studies were done examining the constructs that are related to transformational leadership, which linked them with employees' reactions to change. Studies that were included were of the leader-member relationship (Van Dam, Oreg & Schyns, 2008), perceived leader support (Martin, Jones & Callan, 2005; Rafferty & Griffin, 2006) and visionary leadership (Martin et al., 2005), all of which are part of the broader concept of transformational leadership. Transformational leaders reduce uncertainty associated with organisation change by offering a compelling vision of the future, leaving employees with less room to construct their own interpretations of the situation (Oreg & Berson, 2011).

2.5.2 Influence of transactional leadership on resistance to change.

Bureaucratic authority and legitimacy are the corner stone's that transactional leadership is based on. These leaders emphasise work standards, assignments, as well as task oriented goals. The focus of transactional leaders is on task completion and employee compliance; they also rely quite heavily on organisational rewards and punishments to influence employee performance (Tracey & Hinkin, 1998). By engaging in a transaction with their employees, they try to persuade their subordinates. Transactional leaders explain what is required from their employees and what the compensation will be if they fulfill these requirements (Bass, 1990).

The main focus of transactional leadership is to maintain the status quo and manage the day-to-day operations of the organisation. A focus on identifying the organisation's goals and how employees can work together to increase their productivity in alignment with these goals, as well as increasing organisational profitability, is not present in this leadership style (Avolio et al., 1991).

Two dimensions of transactional leadership exist: contingent reward and management by exception. These two characteristics differ with respect to the leader's activity level and the nature of interaction with followers (Howell & Avolio, 1993).

It becomes evident from the literature that transformational leadership is a much better style when dealing with a constantly changing environment than transactional leadership is.

2.6 Implementation of the change process facilitating resistance to change.

According to Oreg (2008), the focus of planned change theories was on how change can be implemented in organisations. These frameworks described activities that must take place to initiate and carry out successful organisational change.

Providing information to employees is a major aim for leaders, as they must keep employees knowledgeable of anticipated events, such as the specific changes that will occur, the consequences of the changes and employees' new work roles. Provision of information can help reduce uncertainty and anxiety, and contribute ultimately to creating openness towards the change. Poorly managed communication could result in widespread rumors, increased cynicism and resistance to change. Negative outcomes such as absenteeism and turnover will be some of the major outcomes. By allowing employees to participate in the planning and implementation of change in the change management procedures, it has led to an increase of change acceptance (Oreg, 2008).

A significant relationship between employee trust and reaction to organisational change has been found in research studies (Oreg, 2006; Stanley et al., 2005). The change process characteristics appear to play a key role in shaping employees' reactions to change. It was found that the reason why employees are more open to change is influenced by when they receive timely and accurate information about the change and

its implications, when they have opportunities for participation in the implementation of the change, and when they experience trust in those managing the change (Oreg et al., 2008).

Kreitner & Kinicke (2008) discuss four additional recommendations managers should consider when leading organizational change. First of all, an organisation must be ready for change. Secondly, do not make an assumption that people consciously resist change. The uses of a systems model of change to identify the obstacles that are affecting the implementation process are highly encouraged. The success of radical innovative changes will be achieved when middle-level managers are highly involved in the change process. Furthermore, the perceptions or interpretations of employees can significantly affect resistance to change. When benefits of a change overshadow the personal costs, employees are less likely to resist change. The provision of as much information as possible about the change process is advised: inform employees about the reasons for the change, conduct meetings to address employees' questions regarding the change, and provide employees with the opportunity to discuss how the proposed change might affect them. These recommendations underscore the importance of communicating with employees throughout the process of change.

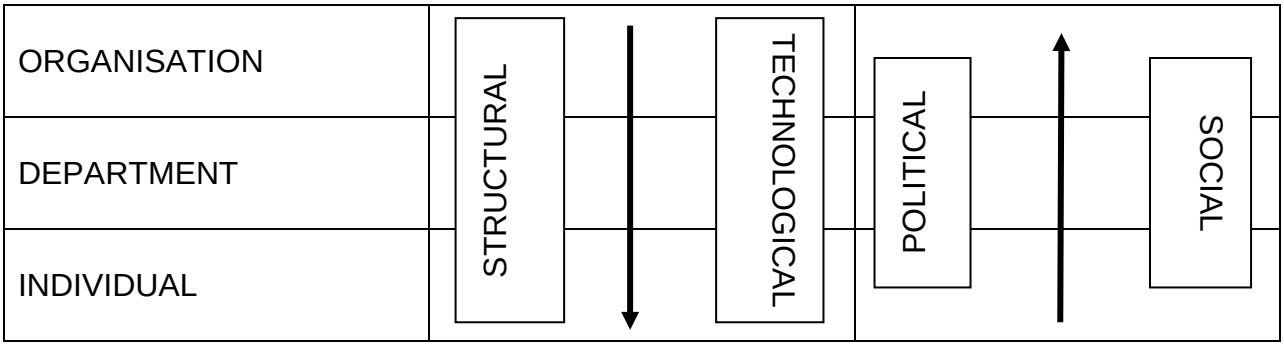
Butcher & Atkinson (2001) discussed the more traditional change management interventions where a more top-down approach was emphasised. The approach will focus on management control, rationality and structure. In this approach the need of the markets and external shareholders are of a high concern. These interventions are very painful, because of the implication of job losses. The recognition that organisations are irrational systems and that social and political concerns play a decisive role in how employees react to change directives, was not a concern. Bottom-up change models, on the other hand, focus on the social and political issues at work in organisations. Political behaviour is used by individuals to achieve their own goals, which may not exactly be the goals envisaged by the change initiators (Drory & Romm, 1990). Bottom-up models create environments where individuals or departments adapt to change at their own pace (Beer et al., 1990). Changes develop organically in operating divisions and departments, from where their influence spreads inwards to the centre and upwards through the organisation. These specific change interventions are process-orientated

and slow-paced. Top and senior managers' roles should be that of "non-directive" change agents, in acknowledgement that they have little power to direct real change.

Not one of these change interventions is appropriate in the modern organisational environment and a systematic approach is suggested by Beer et al. (1990). The importance and impact of external factors are acknowledged, but also allows for the social and political processes to take their course.

Van Schoor (2002) constructed a systematic change model, which displays the top-down and bottom-up influence streams. The resistance phenomenon is addressed in the bottom-up influence stream.

TOP DOWN



BOTTOM UP

Figure 2.2: A systemic approach to organisational change. (Source: Van Schoor, 2001)

A collaborative relationship is required by the systems approach above and this finds expression in a new psychological contract (Macguire, 2002). This contract is characterised by the values and needs acquired for a higher level of recognition than before. Organisations, in return, can lay claim to the skills, knowledge and experience of individuals, but only in proportion to what the work environment contributes to the employees' quality of work life (Van Schoor, 2001).

Effective communication with the organisation is a critical element in the systemic-change strategy. A suggestion was made by Armenakis and Harris (2002), as well as

Szamosi and Duxbury (2002) that the change message and its delivery is important in coordinating the change process.

The only win-win solution suggested by Van Schoor (2001) requires that top-down and bottom-up change actions are synchronised.

2.7 Conclusion

One can derive from the literature that employees' reactions toward change can be influenced by Transformational Leadership through a number of routes. Furthermore, it was shown that the impact of transformational leaders is expected to be positive when talking about the followers' reactions to organisational change.

Change is indeed a difficult and stressful process, where individuals and organisational assumptions about power, role, status and control are threatened. On the other hand, change can also be very energising and essential for healthy individuals and organisations. Coping with change is an essential requirement for success in an ever changing world.

The influence of leadership on the effectiveness of the change process should not be underestimated and needs to be explored.

CHAPTER 3

RESEARCH METHODOLOGY AND RESULTS

3.1 Introduction

The literary review conducted in chapter two indicated that leadership could have a positive or a negative influence on the change process. The method of leading the change process could either lead to successful change or result in resistance to change.

Even though there are various leadership styles and several reasons why employees resist change, this study will be focusing on the relationship between two specific leadership styles and the level of employees' resistance to change.

Additionally, leadership orientation and resistance to change levels were compared for some demographic variables. The findings and explanations from the analysis on the survey data are now presented.

3.2 Overview of the study

3.2.1 Population

The study was conducted at the Potchefstroom campus of the North West University. The population consisted of the academic staff of the Faculty of Engineering, which includes lecturers, senior lecturers and professors, as well as support staff, including administrative officers, laboratory personnel and workshop personnel. The researcher had unlimited access to the population during office hours and was able to distribute the questionnaires and receive them back within a week's time. The population consisted of 75 participants with a response rate of 97%. The respondents that completed the questionnaire formed the sub-population that was studied in this research; we will call them the study population. The entire study population was therefore included in the study. The survey was done by means of a questionnaire.

The population group consisted of four divisions, namely the Dean's office, School of Chemical and Minerals Engineering, Mechanical and Nuclear Engineering, and the School of Electrical, Electronic and Computer Engineering. Each school has a director with various lecturing staff, administrative staff, laboratory staff and workshop staff. More detail on the population will be given under point 3.4.1.

3.3 Procedure and scope of the quantitative research

3.3.1 Research approach

There are various approaches for researchers to capture the needed information, and two main distinguishable research designs, namely qualitative and quantitative approaches.

The qualitative approach is a descriptive form of research rather than a particular design or set of techniques (Welman et al., 2010:188). Qualitative studies can be used in the description of groups, communities and organisations. Qualitative studies may lend themselves to study cases that do not fit into particular theories (Welman et al., 2010:188). On the other hand, quantitative studies are a more objective approach, and seek precise measurement and analysis of target groups (Welman et al., 2010:8).

The purpose of quantative research is to evaluate objective data consisting of numbers, while qualitative research deals with subjective data that are produced by the thoughts of respondents or interviewees (Welman et al., 2010:8).

The researcher chose the quantitative approach to objectively meet the research objectives. The intent was to get as many responses as possible within the timeframe available for this research.

3.3.2 Survey instrument

The instrument used for the survey in this research was the questionnaire. The advantages and disadvantages of the questionnaire were considered and the conclusion was drawn that it was justified for the purpose of this study, given the practical limitations inherent to the population.

Some advantages for using the questionnaire as the survey instrument include keeping the research process as stable as possible, without deviation from the subject's daily routine. The questionnaires were distributed in personnel meetings and everyone completed it in a time slot set aside in the meeting.

In this case, the questionnaires were handed out and no additional cost was incurred to distribute the survey instrument.

Although the questionnaires were handed out in person, anonymity was still accomplished. How anonymity was achieved will be discussed in the ethical consideration (section 3.3.3).

Existing questionnaires were used: the Management Orientation Questionnaire (Coetsee, 2011) and the Resistance to Change Questionnaire (Oreg, 2008).

The Management Orientation Questionnaire consisted of 12 pairs of statements, and within each pair the respondents had to rate the statements that describe their views best.

Please note that the Management Orientation Questionnaire indicates the two variables as Modern Management and Traditional Management. The literature described these two variables as Transformational Management and Transactional Management. Coetsee (2011) confirmed that Transformational Leadership and Modern Management were connected, as well as Traditional Management with Transactional Leadership.

For further discussions, the Modern Management (Transformational Leadership) and Traditional Management (Transactional Leadership) terms will be used, with an indication (in brackets) of the leadership orientation.

Every item pair should divide five points between statements A and B. The statements were rated as follows:

A	B	
5	0	If A is typical of you and B not at all typical
0	5	If B is typical of you and A not at all typical

4	1	If A typifies you well and B to a lesser extent
1	4	If B typifies you well and A to a lesser extent
3	2	If A is somewhat more typical of you than B
2	3	If B is somewhat more typical of you than A

The totals were carried forward to a Modern Management (Transformational leadership) and Traditional Management (Transactional leadership) table; the Modern Management (Transformational leadership) totals were added as follows: Questions 1A, 2A, 3A, 4B, 5A, 6B, 7B, 8B, 9B, 10A, 11B, and 12A. The Traditional Management (Transactional leadership) table consisted of the sum of 1B, 2B, 3B, 4A, 5B, 6A, 7A, 8A, 9A, 10B, 11A and 12B.

The interpretation of the totals was done based on the following key:

TM40-60 (TCL)	MM1-20 (TFL)	Your management orientation is very much that of a traditional manager (Transactional leader).
TM30-39 (TCL)	MM21-30 (TFL)	The traditional approach (Transactional leader) weighs heavier than the modern manager-leader (Transformational leader) approach.
TM10-29 (TCL)	MM31-50 (TFL)	Your orientation and approach are more those of a modern manager-leader (Transformational leader); (the nearer to fifty, the stronger the orientation)
TM1-9 (TCL)	MM51-60 (TFL)	Your approach is strongly that of a modern manager-leader (Transformational leader).

Once the questionnaires were received from the participants, it became clear that some respondents did not follow the instructions correctly. In some instances, respondents gave a score to only one item in an item pair, while some other respondents assigned numbers to both items in a pair, but these numbers did not add up to five.

The method that was used to handle problematic responses of the Management Orientation questionnaire was as follows:

When a person responded with a numerical value only at the A or B item, the numerical value for the missing item was completed, to add up to five.

When the A and B items of a specific question do not add up to five, both values were classified as missing.

To prevent item pairs where both items have missing scores from influencing the total category scores, total scores were calculated as follows:

Modern Management – Total = mean (items constituting the Modern Management [Transformational leadership] scale) * 12

Traditional Management – Total = mean (items constituting the Traditional Management [Transactional leadership] scale) * 12

The Resistance to Change questionnaire (Oreg, 2003) was designed to measure an individual's dispositional inclination to resist change and was measured on a six point likert scale (Strongly disagree = 1, Disagree = 2, Inclined to disagree = 3, Inclined to agree = 5, Agree = 6 and Strongly agree = 7). This scale can be used to account for the individual difference component of resistance to change and to predict reactions to specific change. The average RTC score is the mean of the 17 items (questions 4 and 14 were reverse coded). The following subscales are present within the questionnaire:

Routine seeking: Items 1-5

This factor incorporated routines into one's life. Items included was from both the "preference for low levels of stimulation and novelty" and the "reluctance to give up old habits" dimensions.

Emotional reaction: Items 6-9

This factor combined items from "psychological resilience" and "reluctance to lose control" dimensions.

Short-term focus: Items 10-13

The third factor consisted of four items that reflect a short-term focus when addressing change. The focus here is on the immediate inconvenience or adverse effects of change.

Cognitive rigidity: Items 14-17

This factor addresses the ease and frequency with which individuals change their minds.

3.3.3 Ethical considerations

Participation in this study was completely voluntary. The researcher, as an administrative employee of the faculty, encouraged participation on a personal level by explaining the research objectives, as well as the advantages of the research, to the faculty in more detail than would have been possible through only a written explanation. Willingness to participate in this research was indicated by the completion and return of the questionnaires.

Categories provided in the demographics were specifically chosen in a way to ensure anonymity. Wider groups were selected to ensure that no one could be identified. Completed questionnaires were put in a sealed box provided in the secretary's office.

After data collection, it was clear that no one could be identified by analysing the data. The analysis was done as objectively as possible, and respondents received feedback of the results if they were interested.

3.3.4 Data analysis and overview of statistics used

The completed questionnaires were sent to Statistical Consultation Services at the North-West University Potchefstroom Campus, who captured the data and helped with the data analysis. The computer packages used by them for the analysis were IBM SPSS Statistics 20 (2012), and Statistica 10 (2011).

The statistical analyses included frequency analysis, descriptive statistics, reliability analysis, correlations, independent t-tests, Mann-Whitney tests, ANOVAs and Kruskal-Wallis tests. These statistics will be discussed in more detail in the relevant sections.

Since the study was conducted on the entire population, p-values and statistical inferences are not relevant. P-values will be reported for completeness, but the emphasis will fall on effect sizes for interpretation, which indicate whether results are significant in practice (Ellis & Steyn, 2003).

3.4 Frequency analysis and Descriptive statistics

3.4.1 Demographic variables

The demographic data gathered in the survey included the involvement in a specific school in the faculty, the kind of appointment of the employee, their gender and position in the faculty, as well as their age. Most of this data will not be needed to fulfill the primary objectives of this study, although it was gathered to enable further analysis to be done in future. The respondents consisted of 51 Males and 22 Females, and were distributed into age groups 20 – 29, 30 – 39, 40 – 49, 50 – 59, and 60 and older. The respondents in these categories were 12, 23, 20, 11 and 7 respectively.

35.6% of the study population came from the School of Mechanical and Nuclear Engineering, 26% from Chemical & Minerals Engineering, 13.7% from Electrical, Electronic and Computer Engineering and 21.9% from the Dean's office. Two respondents did not indicate in which school they are employed. The composition of the population is displayed in Figure 3 below.

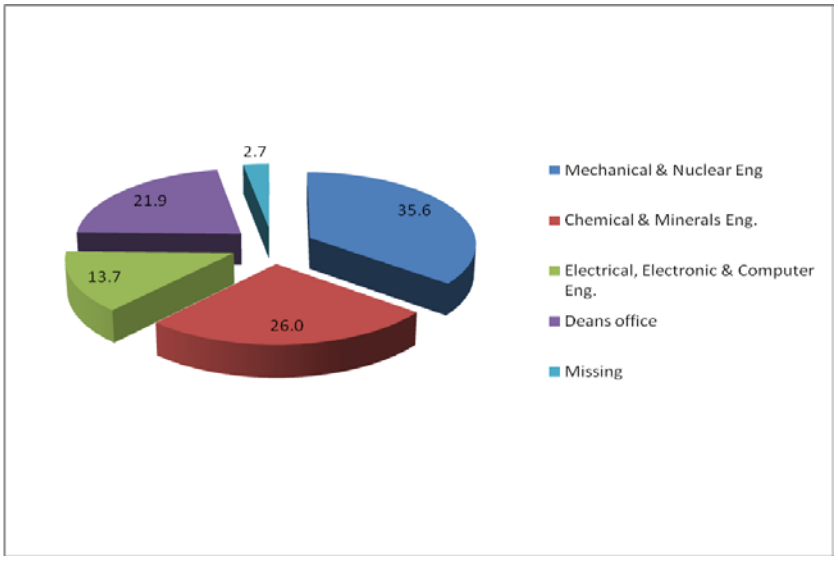
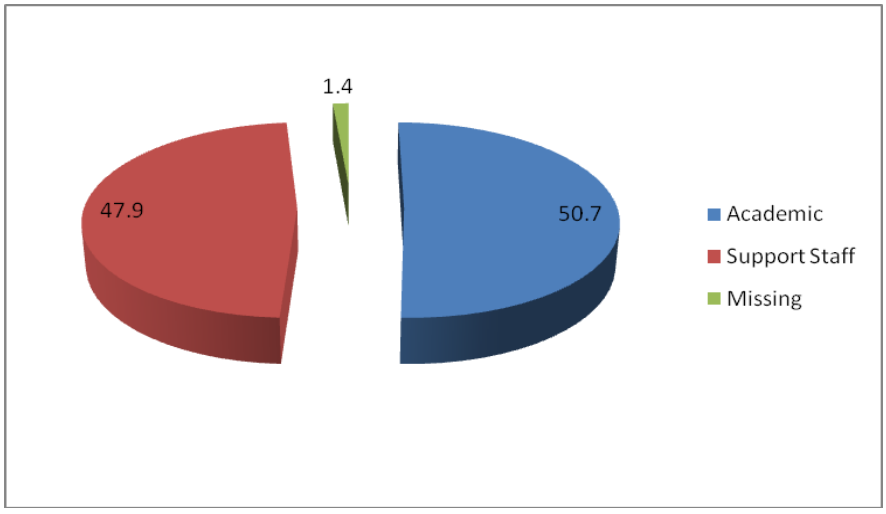


Figure 3.1: Composition of population

The composition of academic and support staff of the population is displayed in Figure 4 below. 50.7% of the respondents were academic staff and 47.9% support staff. Only one respondent did not indicate whether he or she was academic or support staff.



Figue 3.2: Composition of academic- versus support staff

The job position of the population is displayed in figure 5 below. Within the study population, 50.7% of the staff are employed as management and lecturing staff, 27.4% as administrative staff and 20.5% as workshop or lab staff. Only one respondent did not indicate which position he or she was employed in.

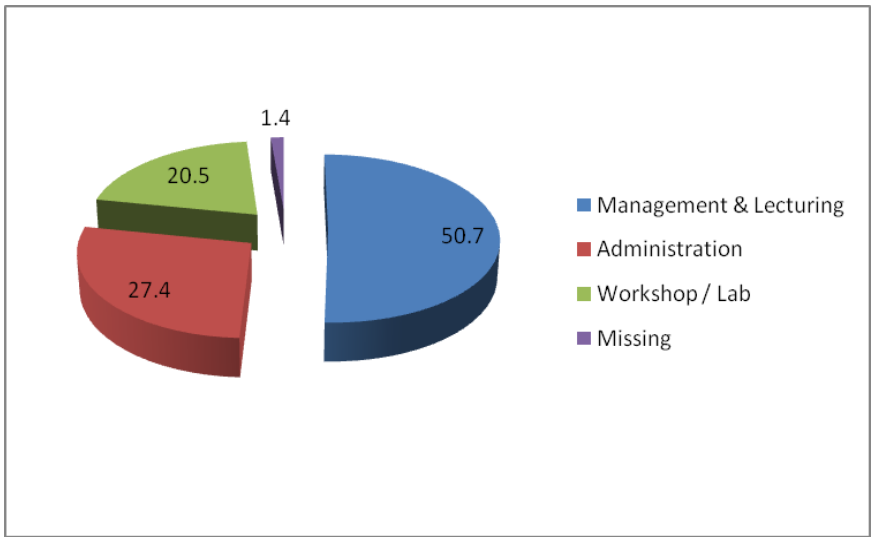


Figure 3.3: Position in the faculty

Comparison of management orientation and resistance to change for the different schools, appointment levels and positions in the faculty will be reported on later.

3.4.2 Management Orientation Questionnaire

Valid percentages are presented in the following table and the descriptive statistics of the Management Orientation Questionnaire is summarised. Valid percentages represent the percentage of respondents who gave a certain response after removal of the missing responses. (Remember the connection to Transformational and Transactional leadership as discussed earlier.)

Table 3.1: Descriptive statistics of the Management Orientation Questionnaire.

	%0	%1	%2	%3	%4	%5	No. Missing	Mean	Std. deviation
MO1A	10.4	6.0	23.9	31.3	16.4	11.9	6	2.73	1.420
MO1B	11.9	16.4	31.3	23.9	6.0	10.4	6	2.27	1.420
MO2A	0	16.2	35.3	27.9	13.2	7.4	5	2.60	1.135
MO2B	7.4	13.2	27.9	35.3	16.2	0	5	2.40	1.135
MO3A	1.5	5.9	25.0	39.7	23.5	4.4	5	2.91	1.018

MO3B	4.4	23.5	39.7	25.0	5.9	1.5	5	2.09	1.018
MO4A	0	8.8	10.3	26.5	29.4	25.0	5	3.51	1.228
MO4B	25.0	29.4	26.5	10.3	8.8	0	5	1.49	1.228
MO5A	0	0	6.1	12.1	53.0	28.8	7	4.05	.812
MO5B	28.8	53.0	12.1	6.1	0	0	7	.95	.812
MO6A	1.5	20.9	23.9	31.3	17.9	4.5	6	2.57	1.184
MO6B	4.5	17.9	31.3	23.9	20.9	1.5	6	2.43	1.184
MO7A	4.4	10.3	22.10	29.4	25.0	8.8	5	2.87	1.280
MO7B	8.8	25.0	29.4	22.10	10.3	4.4	5	2.13	1.280
MO8A	9.0	16.4	25.4	22.4	22.4	4.5	6	2.46	1.363
MO8B	4.5	22.4	22.4	25.4	16.4	9.	6	2.54	1.363
MO9A	8.8	25.0	33.8	20.6	10.3	1.5	5	2.03	1.171
MO9B	1.5	10.3	20.6	33.8	25.0	8.8	5	2.97	1.171
M10A	1.5	11.8	14.7	11.8	45.6	14.7	5	3.32	1.309
M10B	14.7	45.6	11.8	14.7	11.8	1.5	5	1.68	1.309
M11A	0	19.1	23.5	29.4	20.6	7.4	5	2.74	1.205
M11B	7.4	20.6	29.4	23.5	19.1	0	5	2.26	1.205
M12A	4.4	16.2	25.0	29.4	20.6	4.4	5	2.59	1.237
M12B	4.4	20.6	29.4	25.0	16.2	4.4	5	2.41	1.237
	MM								
	TM								

Within Q1, we can see that the managers in the faculty feel that one of their primary tasks is to mobilise and focus people's needs and energies on the work that needs to be done. In Q3, managers focus more on long term goals rather than short term goals; Q5 is about the ability to convince people to identify with them and their thinking, and in Q9

managers feel that it is much more important to create enthusiasm and expectations in the faculty than to focus on structures and policies. Question 10 tests how the employees see management as the creators of opportunities to co-operate. Transformational leadership is an energetic management style that allows leaders to motivate employees through various methods. These leaders move and work among staff members and move employees forward with inspirational words and actions. Through this kind of management style, employees develop a stronger sense of confidence in the company and employees work harder to achieve company goals (Anderson, 2011).

Q4, Q7 and Q11 have a higher mean score for Traditional Management (Transactional leadership) than Modern Management (Transformational leadership). Looking at Q4, we see that employees believe that problems should be solved by obtaining information on preceding or related experiences and to act accordingly. This could create a problem regarding resistance to change, because here we can see that respondents would like to keep the status quo, instead of tackling problems in new and risky ways. Past success can breed complacency, but it can also foster a stubbornness to change, because people believe that what worked in the past will work in the future (Kreitner & Kinicke, 2008). Looking at Q7, one notices that the managers believe they should focus first on the present and then on the future; there is a lesser tendency to focus on the future first and then on the present. This could cause resistance to change, because the direction is not set by managers and employees are uncertain about the future. The moment when innovative or radically different changes are introduced without any warning, employees affected by this will become fearful of the implications thereof (Kreitner & Kinicke, 2008). Q11 indicates that managers have a tendency to clearly define responsibilities of subordinates and do not delegate responsibilities more freely; this factor could create resistance because employees could feel they are not trusted.

Taking the above aspects into consideration, one can see that respondents' management orientation is towards mobilising and focusing people's needs and energies towards the work that needs to be done; they focus more on long term goals than short term goals, as well as the creation of enthusiasm and expectations in the

faculty. On the other hand, looking at the questions focusing on Traditional Management (Transactional leadership), we can see that some of the respondents also feel strongly that they should maintain the status quo and focus more on the present rather than on the future.

Traditional Management (Transactional leadership) comes into action when leaders approach their followers to correct a problem, or to arrange an agreement that will lead to better results; they also make work behaviour more instrumental for followers to reach their own existing goals, while concurrently contributing to the goals of the organisation (Brand et al., 2000).

Transactional leadership remains the organisational model for many people and organisations that have not moved into or encouraged the transformational role needed to meet the challenges of our changing times (Bolden et al., 2003).

On the other hand, Modern Management (Transformational leadership) can achieve exceptional performance by stimulating innovative ways of thinking and changing followers' beliefs and aspirations. These leaders can see the importance of change, have vision and can marshal commitment to that specific vision, to support the required changes. Transformational leadership (Modern Management) leads to higher levels of performance than can be produced by transactional leadership (Traditional Management) (Bass, 1985). MM (TFL) emphasises the value of shared accountability, responsibility and power, and the empowerment of employees, to help leaders and managers achieve organisational goals.

One of the problems leaders are continuously confronted with is the fact that the business environment is constantly changing. As long as companies grow, change is part of the process. Change is important for any organisation, because businesses would likely lose their competitive edge and fail to meet the needs of their customers if they do not adapt to change (Richards, 2011).

3.4.3 Resistance to Change Questionnaire

In the following table, the frequencies & descriptive statistics of the Resistance to Change Questionnaire (RTC) are summarised. As for the MO questionnaire, valid percentages are depicted.

Table 3.2: Descriptive statistics of Resistance to Change.

	%1	%2	%3	%4	%5	%6	No. missing	Mean	Std. deviation
RTC1	20.8	50.0	19.4	6.9	2.8	0	1	2.21	0.948
RTC2	16.9	36.6	21.1	12.7	9.9	2.8	2	2.70	1.324
RTC3	30.1	45.2	19.2	4.1	1.4	0	1	2.01	.890
RTC4(R)	5.5	13.7	26.0	27.4	19.2	8.2	0	3.66	1.315
RTC5	53.4	32.9	8.2	2.7	1.4	1.4	0	1.70	.996
RTC6	6.8	34.2	23.3	26.0	9.6	0	0	2.97	1.130
RTC7	9.6	27.4	17.8	31.5	13.7	0	0	3.12	1.235
RTC8	5.5	27.4	9.6	39.7	15.1	2.7	0	3.40	1.266
RTC9	6.9	41.7	25.0	16.7	6.9	2.8	1	2.83	1.175
RTC10	13.9	38.9	19.4	25.0	2.8	0	1	2.64	1.092
RTC11	16.4	38.4	24.7	15.1	5.5	0	0	2.55	1.106
RTC12	15.1	41.1	20.5	19.2	2.7	1.4	0	2.58	1.129
RTC13	17.8	37.0	26.0	15.1	4.1	0	0	2.5	1.082
RTC14(R)	8.3	30.6	26.4	18.1	13.9	2.8	1	3.07	1.282
RTC15	16.7	25.0	30.6	20.8	2.8	4.2	1	2.81	1.263
RTC16	9.9	21.1	19.7	29.6	14.1	5.6	2	3.34	1.373
RTC17	1.4	12.3	15.1	32.9	35.6	2.7	0	3.97	1.118

From the table above, the following can be seen:

Only one item, RTC5, had an average score of between 1 (Strongly disagree) and 3 (Inclined to disagree). Here, respondents indicated that they would rather be surprised by things than be bored.

Items RTC 1, 2, 3, 6, 9, 10, 11, 12, 13 and 15 had average scores of between 2 (Disagree) and 3 (Inclined to disagree). Looking at these questions, the respondents indicated that they do not see change as that much of a negative thing. They also do not prefer the same tasks every day; the respondents would rather try different and new ways of doing things. Change is not seen as a threat when proposed and they will change their minds about issues when needed.

Items RTC4, 7, 8, 14, 16 and 17 had average scores of between 3 (Inclined to disagree) and 4 (Inclined to agree). Respondents don't look for ways to change their routine when it is stable. They also tense up a bit when change is proposed and when thing don't go according to their plans. The respondents also indicated that they often change their minds about issues regarding their work, but the moment they come to a conclusion they are not likely to change their minds. The consistency over time is also agreed on.

Please note that items 4 and 14 were reverse coded. If we reverse these items scores so that they are in the same direction as the rest of the items, their averages are 3.66 and 3.07 respectively.

No items fell between 4-5 and 5-6.

From the above, it is clear that respondents tended to disagree more with statements which show RTC.

3.5 Reliability and descriptive statistics of the subscales

Instead of working with items individually, average scores of items which form a subscale will be of good use. According to the SAS Manual (2005), "Interrelated items may be summed to obtain an overall score for each participant. Cronbach's coefficient alpha estimates the reliability of this type of scale by determining the internal consistency of the test or the average correlation of items within the test". In other

words, a sufficiently large Cronbach's alpha coefficient will show that the items in the subscale may be summed (or aggregated) because the scale is sufficiently reliable.

Note that it would have been ideal to also conduct factor analyses to show construct validity of the scales for this population. However, the population is too small to allow factor analysis and therefore only reliability results are reported.

The table below summarises the Cronbach's alpha values for each subscale.

Table 3.3: Cronbach alpha values.

	Cronbach alpha values
MM	0.703
TM	0.703
RTC: Routine Seeking	0.640
RTC: Emotional Reaction	0.703
RTC: Short-term focus	0.819
RTC: Cognitive Rigidity	0.565

With regard to the interpretation of Cronbach's alpha, Kline (1999) notes that "although the generally accepted value of 0.8 is appropriate for cognitive tests such as intelligence tests, for ability tests the cut-off point of 0.7 is more suitable." He goes on to say that, when dealing with psychological constructs, values below even 0.7 can, realistically, be expected, because of the diversity of the constructs being measured.

In this study, all alpha values were larger than 0.5, which is not above the often mentioned guideline of 0.7 (Nunally, 1978), but since the study involves psychological constructs, it can be realistically expected. Therefore, for the purpose of this study the author considers the scales to be sufficiently reliable, but further exploration of the scales and its adaptation to this context may be needed in future to enhance the reliability measure.

In the light of the above, average/total scores were calculated for each participant on each construct. In line with the instructions for each scale, total scores were calculated for the Management Orientation subscales and average scores for the Resistance to Change subscales.

Descriptive statistics for these subscale scores are summarised in the table below:

Table 3.4: Descriptive statistics of subscales.

	Mean	Standard deviation
MM (TFL)Total	31.98	6.71
TM (TCL) Total	28.02	6.71
RTC RS	2.39	0.71
RTC ER	3.08	0.87
RTC STF	2.57	0.88
RTC CR	3.51	0.84
RTC Total	2.86	0.57

MM (TFL)	Modern Management (Transformational leadership)
TM (TCL)	Traditional Management (Transactional leadership)
RTC RS	Resistance to change – Routine Seeking
RTC ER	Resistance to change – Emotional reaction
RTC STF	Resistance to change – Short-term focus
RTC CR	Resistance to change – Cognitive Rigidity

Note that reversed phrased items in the RTC scale (4, 14) were reversed before calculation of the Resistance to change subscale and scale scores were done. Modern Management (Transformational leadership) with a mean score of 31.98 is slightly more prevalent than Traditional Management (Transactional leadership), with a mean score

of 28.02 on the Management Orientation Questionnaire. When looking at the Resistance to change scores, the Resistance to change cognitive rigidity and Resistance to change emotional reaction is the highest, showing that the highest resistance in the faculty lies with Cognitive rigidity, with a mean of 3.51 and Emotional reaction with a mean of 3.08.

When classifying the respondent's management style as described by Coetsee (2011), the following was seen:

		Valid %	Description
TM 40-60	MM 1-20	5.90	Your management orientation is very much that of a traditional manager. You will have to work at it to change your views and approaches
TM 30-39	MM 21-30	35.30	The traditional approach weighs heavier than the more modern insights and approaches.
TM10-29	MM31-50	58.80	Your orientation and approach is more that of a modern manager-leader (the nearer to fifty the stronger the orientation)
TM1-9	MM51-60	0	Your approach is strongly that of a modern manager-leader. It could be so strong that it can be dangerous, because you do not take detail and circumstances sufficiently into account.

Taking a look at the total scores of the management orientation questionnaire, there are 35.3% of the respondents whose approach is more to the Traditional Management (Transactional leadership) side, although not that extreme, while 58.8% of the respondents were strongly Modern Management (Transformational leadership) oriented. 5.9% of the respondents' orientation were very much that of a Traditional Management (Transactional leader) manager.

According to Messick and Kramer (2004), the management orientation or leadership style in an organisation is one of the factors that play a significant role in enhancing or

obstructing the interest and commitment of individuals in the organisation. Therefore, it is very important to manage the high percentage of the 41.2% of respondents' Traditional Management (Transactional leadership) orientation, because this could lead to the obstruction of individuals' interest and commitment in the organisation.

3.6 Correlations between factors

Spearman's rank order correlation coefficient was determined to establish the relationship between the Management Orientation and the Resistance to change variables. The correlation coefficient can be considered as an effect size, which gives an indication of the practical significance of the relationship between the two variables. When considering correlations, we have to take into account the direction (sign) and the size of the correlation coefficient. A negative correlation coefficient shows that higher levels of the one variable correspond to lower levels of the other variable. A positive correlation coefficient shows that higher levels of the one variable correspond to higher levels of the other variable.

The size of the correlation coefficient can be interpreted as follows:

± 0.1	Small effect	No practical significant correlation
± 0.3	Medium effect	Practical visible correlation
± 0.5	Large effect	Practical significant correlation

Table 3.5: Correlation coefficient

	RTC RS	RTC ER	RTC STF	RTC CR	RTC
MM (TFL)	-.460	-.282	-.404	-.279	-.474
TM (TCL)	.460	.282	.404	.279	.474

Firstly, the relationship between Modern Management (Transformational leadership) and Resistance to Change Routine Seeking will be looked at, where one can see that it has a negative practical significant correlation of -.460, meaning that the higher the score for Modern Management (Transformational leadership) the lower the score for

Resistance to change routine seeking. Routine Seeking involves the extent to which individuals prefer conventional and highly predictable tasks, procedures and environments (Oreg, 2006). A possible reason why this construct is negatively correlated towards Modern Management (Transformational leadership) is because of the characteristics of Modern Management (Transformational leadership) leaders; these leaders have a great impact on followers by increasing job satisfaction, motivation, innovative capabilities, accountability, improved self-esteem, improved performance, lower absenteeism and reduced work related stress (Carss, 2010). These leaders seek different solutions when solving problems, involve others to take a look at problems from different angles, encourage out of the box thinking and encourage questioning of issues never questioned before (Bass 1998). According to Tichy & Devanna (1986) Modern Management (Transformational leadership) creates adaptive, innovative, entrepreneurial and flexible organisations.

The relationship between Modern Management (Transformational leadership) and Resistance to Change Short-term focus also has a negative practical significant correlation of -.404, meaning that the higher the score for Modern Management (Transformational leadership) the lower the score for Resistance to change short term focus. Short-term focus addresses the degree to which individuals worry about all the inconvenience and discomfort that change brings about, instead of focusing on the potential benefits and comfort that it could bring in the long term (Oreg, 2006). The reason this construct is negatively correlated is possibly because Modern Management (Transformational leadership) leaders communicate the importance of values and beliefs; they stipulate the importance of having a strong sense of purpose, and they consider the moral and ethical consequences of decisions, champion exciting new possibilities and communicate the importance of trust (Bass 1998). These leaders are also optimistic about the future and what needs to be accomplished; they articulate a compelling vision for the future, show confidence that goals will be achieved, present exciting images of the important aspects to consider and they take a stand on important issues. Furthermore, they invest time in teaching and coaching; treat others as individuals and not just as members of a group, look at individuals as having different needs, abilities and aspirations from other individuals. They help develop others'

strengths, listen to others' suggestions and concerns and encourage self-development (Bass 1998). According to Tichy & Devanna (1986) transformational leaders are ready and able to take a risk and face the status quo in the organisation. They have intellectual abilities enabling them to face the reality, even though it is not pleasant. They draw lessons from their own experiences that enable them to be ready, when necessary, to perform radical changes in their own attitudes, approach and behaviour to certain situations. Modern Management (Transformational leadership) leaders are able to face complex, ambiguous and uncertain situations and are ready to face almost every situation they find themselves in. These leaders are extremely good visionaries, as they have an ability to create a future state and communicate it successfully to their followers.

The remaining constructs, Emotional Reaction and Cognitive Rigidity, were also negatively correlated, although slightly smaller than the 0.3 guideline for a medium effect size. Emotional reaction is focused on the extent to which individuals experience discomfort, lack of enthusiasm and anxiety when changes are imposed upon them. Cognitive Rigidity, on the other hand, involves an individual's inflexibility in thinking and difficulty in accepting alternative ideas, perspectives and methods. Modern Management (Transformational leadership) leaders move and work among staff members and move employees forward with inspirational words and actions. Through this kind of management style, employees develop a stronger sense of confidence in the company and work harder to achieve company goals (Anderson, 2011). Transformational leadership in modern managers focuses on the followers, motivates them to achieve a higher performance level and helps develop the leader within each individual (Kendrick, 2011). High levels of transformational leadership or Modern Management have a great impact on followers by increasing job satisfaction, motivation, innovative capabilities, accountability, improved self-esteem, improved performance, lower absenteeism and reduced work related stress (Carss, 2010). High levels of consistency have been found between transformational leadership styles and employee motivation; the research demonstrates higher levels of employee effectiveness, as well as greater employee and customer satisfaction in comparison with non-transformational leadership styles (Curtis & Connell, 2011).

Looking at the relationship between Modern Management (Transformational leadership) and the total Resistance to change correlation coefficient, one can conclude that Modern Management (Transformational leadership) has a negative practical significant correlation, meaning that higher levels of Modern Management (Transformational Leadership), in this case specifically in the faculty of engineering, are associated with lowering the levels of resistance to change.

Moreover, the relationship between Traditional Management (Transactional Leadership) and Resistance to Change (RTC) Routine Seeking (RS) will be looked at and here one can see exactly the opposite of the relationship between Modern Management (Transformational leadership) and Resistance to change routine seeking. It makes sense that the correlations are exactly the same as for Modern Management, just in a different direction, because of the response instruction of the Management Orientation questionnaire that every item must be divided into five points between A and B respectively, in the following manner:

A	B	
5	0	If A is typical of you and B not at all typical
0	5	If B is typical of you and A not at all typical
4	1	If A typifies you well and B to a lesser extent
1	4	If B typifies you well and A to a lesser extent
3	2	If A is somewhat more typical of you than B
2	3	If B is somewhat more typical of you than A

There is a positive practical significant correlation, meaning that the higher the Traditional Management (Transactional leadership) score, the higher the resistance to change routine seeking of .460 is. Resistance to change short-term focus also has a positive practical significant correlation of .404, meaning that the higher the score for Traditional Management (Transactional leadership) the higher the score for Resistance to change short term focus. The reason this construct is positively correlated is because Traditional Management (Transactional leadership) leaders focus on clarifying role and task requirements and providing followers with material or rewards contingent

on the fulfillment of contractual obligations. These leaders define and communicate the work that must be done, how it will be done, and the rewards their followers will receive for completing the stated objectives (Meyer & Botha, 2000). This leadership style comes into action when leaders approach their followers to correct a problem or to arrange an agreement that will lead to better results; they also make work behaviour more instrumental for followers to reach their own existing goals, while concurrently contributing to the goals of the organisation (Brand et al., 2000).

The remaining constructs, Emotional Reaction and Cognitive Rigidity, were also positively correlated, although smaller than the 0.3 guideline.

Looking at the relationship for Traditional Management (Transactional leadership) and the total Resistance to change correlation coefficient, one can conclude that the higher an individual score on Traditional Management (Transactional Leadership) in the faculty, the higher he or she will score on resistance to change.

Taking the above results into consideration, one can see that there is an especially high impact on Resistance to change routine seeking and Short-term focus where the Management orientation is concerned. The environment in which the faculty of engineering is operating is one of constant change and high innovative expectations. Therefore, it is very important for the faculty to emphasise the correct management orientation (leadership style) to achieve high competitiveness. Leadership has been identified in literature as an important subject in the field of organisational behaviour. Leadership is one of the most dynamic effects during individual and organisational interaction, meaning that it is the ability of management to execute a “collaborated effort” that depends on leadership capability (Lee & Chuang, 2009).

3.7 Comparison of Management Orientation and Resistance to Change for demographic variables.

Management Orientation and Resistance to change subscales will now be compared for some of the demographic variables in this study. Independent t-tests will be used to compare the average scores on Management Orientation and Resistance to change for variables with only two categories, namely for appointment. The independent t-test is a parametric test, which relies on assumptions such as normality and homogeneity of

variances. According to the Central Limit Theorem, the assumption of normality of the mean can be assumed to hold when the sample sizes are big (a thumb rule of n>30 is often used). However, for small sample sizes, violations of assumption may have a detrimental effect on the t-test. In such cases, nonparametric tests, such as the Mann-Whitney test, can be conducted, which is more robust against violations from assumptions than the parametric test.

In this study, p-values of both the parametric and nonparametric tests (i.e the independent t-test and Mann-Whitney test respectively) will be reported. Effect sizes for both the parametric and non-parametric test will also be reported and will be the emphasis of interpretation, as discussed before, since the entire population was studied.

Guidelines for the interpretation of the effect sizes are as follows:

The parametric effect size (also called Cohen's d-value) can be interpreted as follows.

0.2	Small effect	No practical significant difference
0.5	Medium effect	Practical visible difference
0.8	Large effect	Practical significant difference

(Ellis & Steyn, 2003).

The non-parametric effect size can be interpreted as:

0.1	Small effect	No practical significant difference
0.3	Medium effect	Practical visible difference
0.5	Large effect	Practical significant difference

(Field, 2009).

To compare the average scores of Management Orientation and Resistance to change subscales for demographic variables with more than 2 categories, namely school in faculty and position in faculty, we will also report the results of both parametric tests as well non-parametric tests, which are robust against violations from assumptions such as

normality. The parametric test is ANOVA and the non-parametric test is the Kruskal-Wallis test.

These tests consist of two parts. First, an omnibus test is conducted to establish whether there are any differences between the mean scores of the Management Orientation or Resistance to change subscales for the categories of the demographic variable. If the omnibus test indicates that there are differences (i.e. $p < 0.05$), then post hoc tests are conducted, which are pair wise comparisons between the average scores for each of the categories, to determine which of the categories differ. Effect sizes can also be calculated for the pair wise comparisons in the post hoc tests, to determine which categories differ practically and significantly on the average scores of the Management Orientation or Resistance to change subscales.

The same guidelines are used to interpret the parametric and non-parametric effect sizes for the post hoc tests of the ANOVA and Kruskal-Wallis tests, as for the effect sizes previously mentioned when only two categories were compared with independent t-tests and Mann-Whitney tests. For the parametric post hoc tests ≈ 0.2 small effect, ≈ 0.5 medium effect, and ≈ 0.8 large effect, and for the non-parametric post hoc tests ≈ 0.1 small effect, ≈ 0.3 medium effect and ≈ 0.5 large effect.

3.8 Comparison of appointment

In the following table, the results for analyses are summarised that determined whether Academic and Support staff differed practically significantly on the dimensions of Management Orientation and Resistance to change in terms of their average scores.

Table 3.6: Comparison of appointment

Academic				Support			(T-test) Parametric test		(Mann-Whitney) Non-parametric test	
	N	Mean	Std. Deviation	N	Mean	Std. Deviation	P-Value	Effect size	P-Value	Effect size
MM	37	33.86	6.84	31	29.74	5.91	0.01	0.60	0.01	0.32
TM	37	26.14	6.84	31	30.26	5.91	0.01	0.60	0.01	0.32
RTC RS	37	2.21	0.70	35	2.60	0.67	0.02	0.55	0.01	0.29
RTC ER	37	2.86	0.84	35	3.33	0.86	0.02	0.55	0.02	0.27
RTC STF	37	2.45	0.91	35	2.68	0.86	0.28	0.25	0.24	0.14
RTC CR	37	3.36	0.70	35	3.63	0.93	0.17	0.29	0.12	0.19
RTC Total	37	2.69	0.60	35	3.03	0.49	0.01	0.56	0.01	0.30

Considering the differences between Academic and Support staff where Modern Management (Transformational leadership) and Traditional Management (Transactional leadership) are concerned, one can see that there is a practical visible difference between the groups on these two variables. The academic staff tends to be more Modern Management (Transformational leadership) orientated with a mean of 33.86 than the support staff with a mean of 29.74.

Considering the medium to large effect sizes that are practically significant for the parametric as well as the non-parametric tests for resistance to change, we derived the following:

Medium to large effect sizes were observed in Resistance to change routine seeking and Resistance to change emotional reaction. When looking at the Resistance to change routine seeking effect sizes, it seems that the support staff with a mean of 2.60 has a higher tendency than the academic staff with a mean of 2.21. Here we can see that the support staff has a higher score for RTC RS involving the preference of conventional and highly predictable tasks, procedures and environments. Looking at the Resistance to change emotional reaction subscale, the support staff with a mean of 3.33 is much higher than the academic staff with a mean of 2.86. Within the subscale emotional reaction, the focus is on the extent to which individuals experience discomfort, lack of enthusiasm and anxiety when changes are imposed upon them. The effect sizes of Resistance to change short term focus and Resistance to change cognitive rigidity had a small to medium effect size, with larger scores for support staff. The medium effect size for total Resistance to change scores clearly indicates that there is a higher tendency among the support staff to resist change than with the academic staff.

Resistance to change by employees could potentially be prevented by better preparation for upcoming changes and by paying attention to aspects of the daily work situation that cause problems. It is critical for the success of change efforts that employees' reactions to change are considered; it can prevent change from developing,

while at the same time it may enhance employees' psychological well-being (Bordia et al., 2004; Fugate, Kiniciki & Scheck, 2002).

3.9 Comparison for position

In the following table the results for analyses are summarised that determined whether management, lecturing-, admin- and workshop staff differed practically significantly on the dimensions of Management Orientation and Resistance to change in terms of their average scores.

Table 3.7: Comparison for position.

	Management			Admin			Workshop			(ANOVA) Parametric test		(Kruskal-Wallis) Non-parametric test	
	N	Mean	Std. Deviation	N	Mean	Std. Deviation	N	Mean	Std. Deviation	p-value omnibus test	Medium to large effect sizes (≥0.45)	p-value omnibus test	Medium to large effect sizes (≥0.25)
MM	37	33.83	6.84	18	30.54	6.87	12	28.28	4.26	0.025	ML vs. A = 0.48 ML vs. WL = 0.81	.019	ML vs. WL = 0.33
TM	37	26.17	6.84	18	29.45	6.87	12	31.72	4.26	0.025	ML vs. A = 0.48 ML vs. WL = 0.81	.019	ML vs. WL = 0.33
RTC	37	2.2	0.71	20	2.39	0.65	15	2.87	0.63	0.008	ML vs. WL	.007	ML vs. WL =

RS											= 0.94 A vs. WL = 0.73		0.37
RTC ER	37	2.88	0.82	20	3.28	1.01	15	3.44	0.58	0.058	ML vs. WL = 0.69	0.599	
RTC STF	37	2.49	0.87	20	2.55	0.89	15	2.88	0.80	0.333	ML vs. WL = 0.45	0.3106	
RTC CR	37	3.42	0.69	20	3.92	1.01	15	3.30	0.76	0.041	ML vs. A = 0.50 A vs. WL = 0.61	.0693	ML vs. A = 0.25
RTC	37	2.71	0.58	20	2.99	0.53	15	3.10	0.43	0.036	ML vs. A = 0.48 ML vs. WL = 0.67	.0286	ML vs. WL = 0.28

Key

ML	Management & Lecturing
A	Administration
WL	Workshop / Lab

A practical significant difference exists between management staff, lecturing staff and workshop staff on average Modern Management and Traditional Management, where the workshop/lab staff have a lower score (28.28) where Modern Management (Transformational leadership) is concerned than the management group (33.83), and a higher score where Traditional Management (Transactional leadership) is concerned (31.72) over 26.17 for the management group. Regarding the management group and admin staff, a practical visible difference also exists on average Modern Management (Transformational leadership), where the management group's score is higher (33.863) than the admin staff (30.54), and average Traditional Management (Transactional leadership) within the admin staff (29.45) is higher than the management group (26.17). Looking at the average resistance to change routine seeking, a practical significant difference exists between the management group (2.2) and workshop staff (2.87) as well as a practical visible difference between the management group (2.2) and admin staff (2.39). Looking at average resistance to change emotional reaction, there is also a practical visible difference between the management group (2.88) and workshop staff (3.44). Here we can see that the workshop staff experience more discomfort, have a lack of enthusiasm, and have more anxiety when changes are imposed than management staff. Concerning average resistance to change short term focus, we can see that the management group (2.49) has a lower average than the workshop staff (2.88). The workshop staff worries more about all inconveniences and the discomfort that change brings about, instead of focusing on the potential benefits and comfort that it could bring in the long term than the management group. Average Resistance to Change cognitive rigidity shows a practical visible difference between the management group (3.42) and admin staff (3.92), as well as workshop staff (3.30). Admin staff is not

very flexible in thinking and have difficulty in accepting alternative ideas, perspectives and methods. Looking at the Resistance to change total, the effect sizes indicate that the management group (with an average of 2.71) has a lower resistance to change than the admin staff (with an average of 2.99). Looking at the workshop staff's effect size, we see that the average for the management group (2.71) is lower than the average of 3.10 for the workshop staff. Taking all of the above into consideration, one can conclude that the higher scores for workshop and admin staff regarding Traditional Management (Transactional leadership) corresponds with their higher average levels of resistance to change when compared with the management group.

The fact that admin and workshop staff do not like to change their routines or change their minds frequently, can have a negative effect on the support towards academic staff within the faculty of engineering. It could be very useful to management to take the workshop and admin staff's reactions into consideration when change is proposed to enhance the change effort. Managers with great trust in their employees make the change process an open, honest and participative affair. Employees who trust their managers are more willing to put in extra effort and take chances with something different. Another reason for resistance to change within workshop staff could be past success. Past success can breed complacency, but it can also foster a stubbornness to change, because people believe that what worked in the past will work in the future.

The change process can be severely hampered by resistance to change and has been associated with negative outcomes such as decreases in satisfaction, productivity, and psychological well-being, as well as increased theft, absenteeism and turnover. Research by Oreg et al., (2008) tied employees' reactions to change to characteristics of the change process, such as management's provision of information concerning change and the extent to which employee participation is enabled.

It was also found in the literature that employees are more open to change when they receive timely and accurate information about the change and its implications, when they have opportunities for participation in the implementation of the change, and when they experience trust in those managing the change (Oreg et al., 2008).

Therefore, it is of the utmost importance for managers to involve support staff in the change process, because they experience a loss of identity, belonging, andmeaning (Strickland, 2000), as well as a loss of mastery (Moran & Brightman, 2001) when not involved in the process. Communication towards support staff is also very important and should be emphasised.

3.10 Comparison of schools within the faculty

In table 8 the results for analyses are summarised that determined whether the Dean's office, Mechanical & Nuclear Engineering, Chemical & Minerals Engineering, and Electrical, Electronic & Computer engineering differed practically significantly on the dimensions of Management Orientation and Resistance to change in terms of their average scores.

Table 3.8: Comparison of schools.

	Dean's Office			Mechanical & Nuclear Eng.			Chemical & Minerals Eng.			Electrical, Electronic & Computer Eng.			(ANOVA) Parametric tests		(Kruskal-Wallis) Non-Parametric tests	
	N	Mean	Std. Deviation	N	Mean	Std. Deviation	N	Mean	Std. Deviation	N	Mean	Std. Deviation	p-value omnibus test	Medium to large effect sizes (≥0.45)	p-value omnibus test	Medium to large effect sizes (≥0.25)
MM	23	31.78	7.37	17	31.97	6.78	10	34.50	4.95	16	31.78	6.58	0.72		0.71	0
TM	23	28.22	7.37	17	28.03	6.78	10	25.50	4.95	16	28.22	6.58	0.72		0.71	0
RTC RS	26	2.56	0.77	19	2.30	0.72	10	2.23	0.71	16	2.33	0.64	0.50		0.49	
RTC ER	26	3.33	0.87	19	2.83	0.78	10	2.85	0.78	16	3.18	1.03	0.22	MN vs. CM = 0.58 MN vs. EEC = 0.55	0.17	

RTC STF	26	2.60	1.05	19	2.58	0.81	10	2.58	0.83	16	2.55	0.81	1.00		0.97	
RTC CR	26	3.49	0.68	19	3.60	0.91	10	3.70	0.91	16	3.42	1.01	0.84		0.79	
RTC	26	2.97	0.60	19	2.80	0.61	10	2.80	0.50	16	2.83	0.57	0.74		0.66	

Key

MN	Mechanical & Nuclear Engineering
EEC	Electrical, Electronic & Computer Engineering
CM	Chemical and Minerals Engineering
D	Dean’s office

When analysing the comparison between schools in the faculty, it is clear that there were almost no practically significant differences between average scores on Management Orientation and Resistance to change for the different schools. The only exception is the practical visible difference between Mechanical & Nuclear Engineering, and Chemical & Minerals Engineering with an effect size of 0.58, as well as Electric, Electronic & Computer Engineering with an effect size of 0.55 regarding resistance to change emotional reaction (fear of losing control). We can see that there is a higher resistance to change regarding emotional reaction within the School of Mechanical & Nuclear Engineering. The members of this school have a tendency to experience discomfort, lack of enthusiasm and anxiety when changes are imposed upon them. Research by Oreg et al., (2008) tied employees' reactions to change to characteristics of the change process, such as management's provision of information concerning change and the extent to which employee participation is enabled. Characteristics such as leadership and organisational climate will likely affect the way change is implemented and consequently how employees react to change (Dam et al., 2008). Resistance to change by employees could potentially be prevented by better preparation for upcoming changes and by paying attention to aspects of the daily work situation that causes problems. It is critical for the success of change efforts that employees' reactions to change are considered; it can prevent change from developing, while at the same time enhancing employees' psychological well-being (Bordia et al., 2004; Fugate, Kiniciki & Scheck, 2002).

Effective communication within the organisation is a critical element in the systemic-change strategy. A suggestion was made by Armenakis and Harris (2002) and Szamosi and Duxbury (2002) that the change message, as well as its delivery, are both important in coordinating the change process.

3.11 Conclusions

As the whole population of the faculty of engineering, North-West University, Potchefstroom campus responded to the questionnaire, it provided the researcher with usable data: the respondents of the study represented 97% of the complete population of the faculty.

All alpha values of the subscales of measurement instruments were larger than 0.5, which is not above the often mentioned guideline of 0.7 (Nunally, 1978), but since the study involves psychological construct, it can be realistically expected (Field, 2009).

As was expected from the literature study, the data showed a significant negative correlation between the Modern Management (Transformational leadership) and resistance to change levels and a significant positive correlation between Traditional Management (Transactional leadership) and resistance to change, meaning that the higher the Modern Management (Transformational leadership) score, the lower the resistance to change levels and vice versa.

Chapter 3 was devoted to the research methodology, the presentation of the results, and discussions of the analysis between the relationships. Chapter four will be devoted to recommendations and suggestions to the management of the faculty of engineering on how to minimise the resistance to change levels within the faculty. Some suggestions will also be given on how to generate higher levels of change initiatives to reduce resistance to change.

CHAPTER 4
CONCLUSIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

The main objective of this study was to determine whether a relationship exists between leadership style and the level of resistance to change related to that specific leadership. The group being studied consisted of the whole population of the Engineering faculty at the North-West University, Potchefstroom Campus. The degree of leadership present within this group and the resistance to change levels of employees were perceived to be important attributes possibly affecting organisational performance.

A quantitative study was done, with an expectation that the group being studied would have low levels of resistance to change under Modern Management (Transformational Leadership) and high levels of resistance to change under Traditional Management (Transactional Leadership). The empirical data collected and analysed in chapter three confirmed the expectation created by the literature review: a relationship does exist between management orientation and resistance to change. This relationship was confirmed when high scores of Modern Management (Transformational leadership) were measured with a negative correlation coefficient in resistance to change, and high scores of Traditional Management (Transactional leadership) were measured with a positive correlation coefficient in resistance to change being found.

This chapter aims to summarise the results of the study and to propose recommendations to the management of the faculty of engineering after interpreting the results.

4.2 SUMMARY OF RESULTS

The survey was done by using two questionnaires as measuring instruments, namely the Resistance to Change (RTC) questionnaire and the Management Orientation Quesionnaire (MO) as described in chapter three. The management orientation construct was analysed

under the sub sections Modern Management (Transformational leadership) and Traditional Management (Transactional leadership). The Management Orientation construct's sub sections scored average scores of 31.98 for Modern Management (Transformational leadership) and 28.02 for Traditional Management (Transactional leadership) and standard deviations of 6.71 for Modern Management (Transformational leadership) and 6.71 for Traditional Management (Transactional leadership). Cronbach alpha coefficients of 0.685 for Modern Management (Transformational leadership) and 0.693 for Traditional Management (Transactional leadership) were found.

The Resistance to change questionnaire's constructs were analysed under the sub sections Resistance to change Routine Seeking, Resistance to change Emotional Reaction, Resistance to change Short term focus and Resistance to change Cognitive Rigidity. The Resistance to change construct's sub sections scored average scores of 2.39 (RTC RS), 3.08 (RTC ER), 2.57 (RTC STF) and 3.51 (RTC CR). Cronbach alpha coefficients of 0.640 (RTC RS), 0.703 (RTC ER), 0.819 (RTC STF) and 0.565 (RTC CR) were found.

The above mentioned scores substantiated the trustworthiness and reliability of the results.

The study population for this research consisted of 35.6% respondents from the school of Mechanical & Nuclear Engineering, 26% from the school of Chemical & Minerals Engineering, 13.7% from the school of Electrical, Electronic & Computer Engineering and 21.9% from the Dean's office.

As reported in chapter 3, the Modern Management (Transformational leadership) scores of academic staff were higher than the support staff's Modern Management (Transformational leadership) score, and the score of Traditional Management (Transactional leadership) of support staff was higher than the academic staff's score. When analysing the management orientation scores with the resistance to change scores, the scores of resistance to change were higher for the support staff, with a higher score in Traditional Management (Transactional leadership), and lower scores for the academic staff with a higher score in Modern Management (Transformational leadership), proving that there is a correlation between management orientation and resistance to change.

When the researcher studied the effect sizes of the various positions, namely management-, admin- and workshop staff in the faculty, the conclusion was drawn that the management group had a bigger mean score of 33.83 for Modern Management (Transformational leadership) than the admin group (30.54) and the workshop group (28.28). The mean scores for the Traditional Management (Transactional leadership) were 26.17 for the management group, 29.45 for the admin group and 31.72 for the workshop group, which concluded that the workshop group had the highest mean score for Traditional Management (Transactional leadership) and the lowest mean score for Modern Management (Transformational leadership). This correlates with the Resistance to change total mean score of 3.10 for the workshop group, 2.99 for the admin group and 2.71 for the management group. This factor is proof that when Traditional Management (Transactional leadership) orientation is high, the Resistance to change will also be high.

When the researcher evaluated the Resistance to change constructs separately, the following was observed: The mean scores of Resistance to change routine seeking, Resistance to change emotional reaction and Resistance to change short term focus were the highest within the workshop group, giving an indication of where the biggest Resistance to change within the workshop group occurs. The workshop group had a tendency to prefer conventional and highly predictable tasks, procedures and environments, followed by the experience of discomfort, lack of enthusiasm and anxiety when changes are imposed upon them. The mean score of Resistance to change cognitive rigidity was higher for the admin group than for the workshop- as well as the management group, giving us an indication that the admin group showed inflexibility in thinking and a difficulty in accepting alternative ideas, perspectives and methods. These responses of resistance to change is concerning because of the highly innovative and research orientated environment the faculty is operating in. The prerogative of the workshop group is to adapt certain machines and processes to enhance the research and improve the innovations of the researchers. If the Resistance to change levels remains the same, this could be of great concern to the faculty when the goal is to improve their research and undergraduate projects. The inflexibility and difficulty to accept new ideas, perspectives and methods of the admin group is not ideal in supporting

management, especially when new processes and systems are implemented in the faculty to enhance the flow of work and to improve productivity.

Taking a look at the comparison between schools, there were almost no practically significant differences between average scores on Management Orientation and Resistance to change. The only exception was the practical visible difference between Mechanical & Nuclear engineering and Chemical & Minerals engineering regarding Resistance to change emotional reaction. The members of the School of Mechanical & Nuclear Engineering had a tendency to experience discomfort, lack of enthusiasm and anxiety when changes are imposed upon them, more so than in any of the other schools.

4.3 HOW THIS RESEARCH CONTRIBUTES TO ACADEMIC KNOWLEDGE

Various researchers have focused on the subjects of leadership and resistance to change, as well as the interactions between them. Research on many different aspects relating to leadership and resistance to change was found during the literature review, but no study could be found where these two constructs' relationship was tested within a group within the higher education sector in an engineering faculty. The critical changes in the education environment and expectations from the industry of the education sector, and especially for future engineers, are substantial. These changes lead to increased levels of stress and adaptation of employees to implement the suggested changes.

This research contributes to the already vast content of research on leadership and resistance to change and does so by being focused on studying these constructs under a unique set of circumstances.

4.4 RECOMMENDATIONS TO MANAGEMENT AND FOLLOW-UP

The results of this research may give management insight into some of the interpersonal dynamics at work within the faculty at various levels. Some conclusions may be reached regarding leadership, resistance to change and the impact of these variables in the various schools.

The relatively high occurrence of Modern Management (Transformational leadership) in the faculty should give management confidence that the road of transformation will be traveled with relative ease. The high score of Traditional Management (Transactional leadership) under the support staff, however, that leads to high Resistance to change scores, could be of concern to management, especially when systems and procedures need to be changed to assist management in their endeavors, leading to improvement of their research capabilities and innovativeness to remain competitive in the environment the faculty is operating in.

The main focus of traditional management (transactional leadership) is to stick with the status quo and manage the day-to-day operations of the organisation. The focus on identifying the organisation's goals and how employees can work together to increase their productivity in alignment with these goals as well as increasing organisational profitability is not present in this leadership style (Avolio et al., 1991). It is of the utmost importance for management to involve the support staff, by identifying goals and plans to increase their productivity and removing uncertainty in their working environment to overcome this problem. Leadership training and understanding of the change process and resistance to change at all levels can also be a beginning to increase the Modern Management (Transformational leadership) score under support staff, meaning that resistance to change levels will decline.

Resistance to change by employees could potentially be prevented by better preparation for upcoming changes and by paying attention to aspects of the daily work situation that cause problems. It is critical for the success of change efforts that employees' reactions to change are considered; it can prevent resistance to change from developing, while at the same time may enhance employees' psychological well-being (Bordia et al., 2004; Fugate, Kiniciki & Scheck, 2002).

The resistance to change levels within admin and workshop staff, especially in the subscales routine seeking and emotional reaction, should be investigated. Items included in routine seeking was from both the "preference for low levels of stimulation and novelty" and the "reluctance to give up old habits" dimensions. Emotional reaction combined items from "psychological resilience" and "reluctance to lose control" dimensions. Factors included in

these constructs should be looked at and improved, to minimise resistance to change within the support staff of the faculty.

Communicating all relevant information to employees regarding anticipated events, such as the specific changes that will occur, the consequences of the changes and employees' new work roles will help to reduce resistance to change. Provision of information can help reduce uncertainty and anxiety, and contribute ultimately to creating openness towards the change. Poorly managed communication could result in widespread rumours, increased cynicism and resistance to the change. Negative outcomes such as absenteeism and turnover will be a few of the major consequences. Allowing employees to participate in the planning and implementation of change in the change management procedures has led to the increase of change acceptance (Oreg, 2008).

For the purpose of this study, the researcher considered the scales of the Resistance to Change questionnaire sufficiently reliable, but further exploration of the scales and its adaptation to this context may be needed in future to enhance reliability measures.

Detail research could be done in future to identify whether leadership training and workshops on managing change will improve the levels of Modern Management (Transformational leadership) scores under the support staff.

4.5 CONCLUSION

It can be concluded that, to be more effective in creating and supporting change within organisations, managers need to learn to recognise the manifestations of resistance in themselves as well as in others (Kreitner & Kinicke, 2008). Managers should also learn how to implement change in such a way that the minimum resistance occurs and that uncertainty regarding change is removed.

The necessity of the correct leadership style within an organisation cannot be underestimated. It could mean the difference between success and failure.

REFERENCES

Adair, J. 1973. Action-Centred Leadership. New York: McGraw-Hill.

Antonakis, J., Avolio, B.J. & Sivasubramaniam, N. 2003. Context and leadership: an examination of the nine-factor full range leadership theory using the Multifactor Leadership Questionnaire, *The leadership quarterly, 14:261–295.*

Appelbaum, S.H. 1998. Strategic organisational change: the role of leadership, learning, motivation and productivity. *Management Decision*, 36(5):289.

Armenakis, A.A. & Harris, S.G. 2002. Crafting a change message to create transformational readiness. *Journal of Organisational Management*, 15(2):169-183.

Avdjieva, M. & Wilson, M. 2002. Exploring the development of quality in higher education. *Managing service quality*, 12(6):372-383.

Bartunek, J.M., Rousseau, D.M., Rudolph, J.W. & DePalma, J.A. 2006. On the receiving end: Sensemaking, emotion, and assessments of an organizational change initiated by others. *Journal of Applied Behavioural Science, 42:182-206.*

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

Bass, B., M., Avolio, B.J., *eds.* Improving organizational Effectiveness through Transformational Leadership. USA: Sage Publications.

Bass, B.M. & Riggio, R.E. 2006. Transformational leadership. 2nd ed. Mahwah, NJ: Erlbaum.

Bass, B.M. 1990. From Transactional to Transformational Leadership. Leadership: Learning to Share the Vision. *Organisational Dynamics*. 19(3):19-31.

Beer, M., Eisenstat, R.A. & Spector, B. 1990. Why change programs don't produce change. *Harvard Business Review*, 68(6):158-166.

Beer, M. & Nohria, N. 2000. Cracking the code of change. *Harvard Business Review*, 78(3):131-143.

Berson, Y. & Avolio, B.J. 2004. Transformational leadership and the dissemination of organizational goals: A case study of a telecommunication firm. *Leadership Quarterly*, 15:625-646.

Blake, R.R. & J.S. Mouton. 1964. The magerial grid. Houston TX: Gulf.

Bodla, M.A. 2010. Comparative Study of Full Range Leadership Model among Faculty Members in Public and Private Sector Higher Education Institutes and Universities. *International Journal of Business and Management.* 5(4).

Bok, D. 2006. Our underachieving colleges: A candid look at how much students learn and why they should be learning more. Princeton, NJ: Princeton University Press.

Bolden, R., Gosling, J., Marturano, A. & Dennison, P. 2003. A review of Leadership theory and competency frameworks. Centre for Leadership studies.

Bordia, P., Hunt, E., Paulsen, N., Tourish, D., & DiFonzo, N. 2004. Uncertainty during organizational change: Is it all about control? *European Journal of Work and Organisation Psychology*, 13:345-365.

Borins, S. 2002. Leadership and innovation in the public sector. *Leadership and Organisational Development Journal*, 23(8):467-476.

Bovey, W.H. & Hede, A. 2001. Resistance to organizational change: the role of defence mechanisms. *Journal of Managerial Psychology*, 16(7):534-548.

Brand, C., Heyl, G. & Maritz, D. 2000. “Leadership”. In Meyer, M. and Botha, E., eds. Organisational Development and Transformation in South Africa. Durban: Butterworths.

Butcher, D. & Atkinson, S. 2001. Stealth, secrecy and subversion: The language of change. *Journal of Organisational Change Management*, 14(6):554-569.

Burkins, M.B. & Grasso, D. 2010. Holistic Engineering Education, Beyond Technology. New York: Springer Science & Business Media.

Cao, G., Clarke, S. & Lehaney, B. 2000. A systemic view of organizational change and TQM. *The TQM Magazine*. 12(3):186-193.

Carr, A. 2001. Understanding emotion and emotionality in the process of change. *Journal of organizational change management*, 14(5):421-436.

Carson, T.C. 1999. Organisational change and strategies for turbulent environments. *The Journal of Modern Business.* DCPress, Craft Systems, Inc.

URL:www.dcpres.com/jmb/jmb1999.htm (Accessed 13 August 2012).

Curtis, E., O'Connell, R. 2011. Essential leadership skills for motivating and developing staff. *Nursing Management* 18 (5):32-35.

Coetsee, L.D. 2011. Peak performance and productivity. *A practical guide for the creation of a motivating climate.* Potchefstroom: Andcork Publishers.

Coghlan, D. 1993. "A person-centered approach to dealing with resistance to change". *Leadership & Organisation Development Journal*, 14(4):10-14.

Deal, T.E., & Kennedy, A.A. 2000. Corporate Cultures. The Rites and Rituals of Corporate Life. Cambridge: Perseus Publishing.

http://www.businessdictionary.com/definition/leadership (Accessed 12 January 2012).

Dehler, G.E. & Walsh, M.A. 1994. Spirituality and organizational transformation. *Journal of Managerial Psychology*, 9(6):17-26.

Dent, E. & Goldberg, S. 1999. Challenging "resistance to change". *Journal of Applied Behavioural Science*, 25-41.

South Africa. Department of Education. 2002. A new institutional landscape for higher education.

Dirks, K.T., & Ferrin, D.L. 2002. Trust in leadership: Meta-analytic findings and implications for research and practice. Journal of Applied *Psychology*, 87:611-628.

Drory, A. & Romm, T. 1990. The definition of organizational politics: A review. *Human Relations*, 43(11):1133-1154.

Ellis, S.M. & Steyn, H.S. 2003. Practical significance (effect sizes) versus or in combination with statistical significance (p-values). *Management Dynamics,* 12(4):51-53.

Elrod II, P.D. & Tippett, D.D. 2002. The "death valley" of change. *Journal of organizational change management*, 15(3):273-291.

Fiedler. 1967. A Theory of Leadership Effectiveness. New York: McGraw-Hill.

Field, A. 2009. Discovering statistics using SPSS. 3rd ed. London: Sage Publications.

Floger, R. 1999. "Unfairness and resistance to change: hardship as mistreatment". *Journal of Organisational Change Management,* 12(1):35.

Folger, R & Skarlicki, D. 1999. Unfairness and resistance to change: hardship as mistreatment. *Journal of Organisational Change Management*, 35-50:76.

Ford, J.D., & Ford, L.W. 2009. Managing Yourself: Decoding Resistance to Change. *Harvard Business Review*.

Fugate, M., Kinicki, A.J., & Ashforth, B.E. 2004. Employability: A psycho-social construct, its dimenstions, and applications. *Jounal of Vocational Behaviour*, 65:14-38.

Groves, K.S. 2005. Linking leader skills, follower attitudes, and contextual variables via an integrated model of charismatic leadership. *Journal of Management*, 31:255-277.

Hanson, R. 2003. Organisation Change: How to survive, and Thrive (http://www.washingtong.edu/admin/hr/pod/leaders/orgdev/alliance/articles/org-change.pdf, Date of Access 3 Aug. 2012.

Hernez-Broome, G., Hughes, R.L. 2010. Leadership development: Past, Present and Future. *Human Resource Planning*.

Hitt, M., Keat, B.A. & Nixon, R.D. 1996. "Rightsizing: building and maintaining strategic leadership and long-term competitiveness". *Organisational Dynamics,* p 18-32.

Howell, Avolio. 1993. Transformational leadership, transactional leadership, locus of control and support for innovation: Key predictors of business unit performance. *Journal of Applied Psychology*, 78:891-92.

Jones, S., Harvey, M., Lefoe, G., Ryland, K. & Schneider, A. 2011. Report to ALTC Leadership Meeting, LE9-222, February. (Unpublished).

Jones S., Lefoe F., Harvey M. & Ryland K. 2012. Distributed leadership: a collaborative framework for academics, executives and professionals in higher education. *Journal of Higher Education Policy and Management.* 34(1): 67-78.

Kaiser, R.B. & Overfield, D.V. 2010. The Leadership Value Chain. The *Psychologist-Manager Journal*, 13:164-183.

Kreitner, R. & Kiniki, A. 2008. Organisational Behaviours. McGraw Hill. New York. Cummings & Worley.

Lee AND Chuang. 2009. The Impact of Leadership styles on Job Stress and Turnover Intention: Taiwan Insurance Industry as an Example. www.hclee@ttu.edu.tw. Date of access 14 Febr. 2012.

Maguire, H. 2002. Psychological contracts: are they still relevant? *Career Development International*, 7(3):167-180.

Leucke, R. 2003. Managing Change and Trasition. Boston, Massachusetts: Harvard Business School.

Martin, A.J., Jones, E.S. & Callan, V.J. 2005. The role of psychological climate in facilitating employee adjustment during organizational change. *European Journal of Work and Organisational Psychology*, 14:263-283.

Martin, H.H. 1975. “How we shall overcome resistance”. *Training and Development Journal,* 29(9):32-40.

Maurer, R. 1997. “Transforming resistance”. *HR Focus*, 74(10):9-10.

MCGregor, D. 1960. The Human Side of Enterprise. New York: McGraw Hill.

Messick, D.M. & Kramer, R.M. 2004. The Psychology of Leadership: New Perspectives and Research. New Jersey: Lawrence Erlbaum Associates, Publishers.

Meyer, M. & Botha, E. 2000. Organisation Development and Transformation in South Africa. Durban: Butterworths.

Miner, J.B. 2006. Organisational behaviour 1: Essential Theories of Motivation and Leadership, M.E. Shapre, Inc. New York.

Moran, J.W. & Brightman, B.K. 2001. Leading organizational change. *Career development international*, 6(2):111-119.

Myers, K. AND Robbins, M. 1991. “10 rules for change”. *Executive Excellence*, 8(5):9-10.

Nadler, D.A. 1981. “Managing organizational change: an integrative perspective”, *The Journal of Applied Behavioural Science*, 17(2):191-211.

Nunnally, J. 1978. Psychometric theory, New York: McGraw-Hill Companies.

Oreg, S. 2003. Resistance to change: Developing an individual differences measure. *Journal of Applied Psychology*, 88:680-693.

Oreg, S. 2006. Personality, context and resistance to organisation change. *European Journal of Work and Organisational Psychology*, 15:73-101.

Oreg, S. & Berson, Y. 2011. Leadership and employees reactions to change: The role of leaders personal attributes and transformational leadership style. *Personnel Psychology*, 64:627-659.

Oreg, S. & Nov, O. 2008. Exploring motivations for contributing to open source initiatives: The roles of contribution context and personal values. *Computers in Human Behaviour*, 24:2055-2073.

Parry, K.W. 2006. Transformational Leadership: Developing and Enterprising Management Culture, Melbourne: Pitman Publishing, Pearson Professional (Pty) Ltd.

Rafferty, A.E. & Griffin, M.A. 2006. Perceptions of organizational change: A stress and coping perspective. *Journal of Applied Psychology*, 91:1154-1162.

Rath, T. 2004. The impact of positive leadership. Gallup Press. http://businessjournal.gallup.com Date of access: 17 March 2012.

Ringel, R.L. 2000. Managing Change in Higher Education. Assessment and accountability Forum. Fall 2000.

SAS Institute Inc., 2005. SAS Institute Inc., SAS OnlineDoc®, Version 9.1, Cary, NC.

Smith, B.L. & Hughey, A.W. 2006. Leadership in higher education – its evolution and potential. *Industry & Higher education*.

Smith, I. 2005. "Achieving readiness for Organisational change". *Library Management,* 26(6):408-409.

Spiker, B.K. & Lesser, E. 1995. "We have met the enemy". *Journal of Business Strategy*, 16(2):17-21.

SPSS Inc. 2012. SPSS Statistics 20. Release version 21.0.0. Copyright by SPSS, Inc., Chicago, IL. www14.software.ibm.com.

Stanley, D.J., Meyer, J.P. & Topolnytsky, L. 2005. Employee cynicism and resistance to organizational change. *Journal of Business and Psychology*, 19:429-459.

StatSoft, Inc. 2011. STATISTICA (data analysis software system), version 10. www.statsoft.com. Date of access: 15 May 2012.

Steinburg, C. 1992. "Taking charge of change". *Training and Development*, 46(3):26.32.

Stogdill, R. 1974. Handbook of Leadership 1st -ed., New York: Free Press.

Strickland, D. 2000. Emotional intelligence: The most potent factor in the success equation.

Szamosi, L.T. & Duxbury, L. 2002. Development of a measure to asses organizational change. *Journal of Organisational Change Management*, 5(2):184-201.

Tannenaum, R. & Schmidt, W. 1958. How to choose a leadership pattern. *Harvard Business Review,* 36(2):95-101.

Taylor, J. 2009. The cluttered mind uncluttered. Business: Why change is so hard, and how to make it easier. http://www.psychologytoday.com/blog/the-power-prime/200910/business-why-change-is-so-hard-and-how-make-it-easier? Date of access: 06 Aug. 2012.

Tichy, N. & Devanna, M. 1986. The Transformational Leader, John Wiley and Sons, Incl, USA.

Tracey, J. & Hinkin, T. 1998. Transformational leadership or effective managerial practices? *Group & organisation management*, 23:220-236.

Trader-Leigh, K. E. 2002. Case study: Identifying resistance in managing change. *Journal of organizational change management*, 15(2):138-155.

Van Dam, K., Oreg, S. & Schyns, B. 2008. Daily Work Contexts and Resistance to Organisational Change: The Role of Leader-Member Exchange, Development Climate, and Change Process Characteristics. *Applied Psychology: An international Review, 57(2):313-334.*

Van Schoor, W. A. 2001. Corporate universities and education for quality. Pater presented at the Global Corporate Universities Week, Geneva: Switserland.

Van Schoor, W.A. 2002. Our response to the transformation imperative: The role of transformational intelligence in facilitating the process. Paper presented at the Transformation Workshop: Johannesburg, South Africa.

Van Schoor, A. 2001. Learning to overcome resistance to change in higher education: the role of Transformational Intelligence in the process. HERDSA 2003 conference proceedings.

Van Velsor, E. & MCCauly, C. D. 2004. "Our view of leadership development." In C.D. McCauley and E. VanVelsor (eds.), The Center for Creative Leadership Handbook of Leadership Development. 2nd ed. San Francisco: Josssey-Bass, 1-22.

Warrilow, S. 2009. Transformational Leadership Theory – The 4 Key components in leading change & Managing change. http://ezinearticles.com/?expert=Stephen_Warrilow. Date of access: 12 April 2012.

Whelan-Berry, K.S., Gordon, J.R. & Hinings, C.R. 2003. Strengthening organizational change processes: Recommendations and implications from a multi-level analysis. Journal of Applied Behavioural Science, 39,186-207.

Wolinski, S. 2010. Leadership Defined. http://managementhelp.org/blogs/leadership/2010/04/06/leadership-defined. Date of access: 12 February 2012.

Watson, G. 1969. Resistance to change. In W.G. Bennis, K.D. Benne & R. Chin eds. The planning of change. 2nd ed New York: Holt, Rinehart & Winston. 488-498.

Zaltman, G. & Duncan, R. 1977. Strategies for Planned Change. New York, NY: John Wiley & Sons.

Zeidan, H. 2009. The Blake Mouton Managerial Grid. Identifying five different leadership styles. 3rd Quarter Issue 39. The Certified Accountant.

APPENDIX A

DEMOGRAPHICS

School within faculty

Mechanical & Nuclear Eng.	1
Chemical & Minerals Eng.	2
Electrical, Electronic & computer Eng.	3
Deans Office	4

Age

20 – 29	1
30 – 39	2
40 – 49	3
50 – 59	4
60 and older	5

Appointment

Academic Staff	**1**
Support Staff	**2**

Gender

Male	**1**
Female	**2**

Position in the faculty

Management & Lecturing	**1**
Administration	**2**
Workshop / Lab	**3**

SECTION A: MANAGEMENT ORIENTATION QUESTIONNAIRE

At work everyone has management responsibilities in some way or another. Think of the management responsibilities you have at work. Please respond to these questions in this regard.

How to complete the questionnaire:
This questionnaire consists of twelve (12) pairs of statements. With each pair indicate which statement (A or B) describes your views best. The alternatives may sometimes be equally valid (true) or may be equally uncharacteristic (untrue). You must, however, choose the alternative which describes you or your views best, or are the nearest to it.

At every item you must divide five (5) points between A and B, in one of the following ways, every time:

A	***B***	
5	*0*	*If A is typical of you and B not at all typical*
0	*5*	*If B is typical of you and A not at all typical*
4	*1*	*If A typifies you well and B to a lesser extent*
1	*4*	*If B typifies you well and A to a lesser extent*
3	*2*	*If A is somewhat more typical of you than B*
2	*3*	*If B is somewhat more typical of you than A*

- *Use whole numbers only and make sure that the sum allocated to each pair is five (5)*
- *Use all the time necessary to decide on each pair of statements.*
- ***Important: Be honest – give your honest views.***

Management orientation questionnaire

1. As a manager the primary task that I have is:

	A	A. To mobilize and focus people's needs and energies
	B	B. To ensure that my subordinates have clarity in regard to their responsibilities and roles

2. For me management should be:

	A	A. Inspirational
	B	B. Practical

3. My preference in my managerial work is to think of the:

	A	A. Long term (what can be)
	B	B. Short term (what is realistic)

4. I choose to solve problems by:

	A	A. Obtaining information on preceding or related experiences and to act accordingly
	B	B. Tackling it in new and risky ways

5. The power I have to influence other people is primarily based on my:

	A	A. Ability to convince people to identify with me and my thinking
	B	B. Status and position

6. In my managerial work:

	A	A. The circumstances mainly determine what is going to occur
	B	B. I mainly determine what will happen

7. As a manager I have to:

	A	A. Focus on the present first and then on the future
	B	B. Focus on the future first and then on the present

8. I believe management is principally the:

	A	A. Reduction of uncertainty
	B	B. Influencing of others to change

9. As a manager I have to:

	A	A. Focus on structures and policy
	B	B. Create enthusiasm and expectations

10. I see management as the:

	A	A. Creation of opportunities to co-operate
	B	B. Planning and control of people's work

11. As a manager I must:

	A	A. Clearly define the responsibilities of subordinates
	B	B. Delegate responsibilities more freely

12. As a manager I must be:

	A	A. Prepared to attempt new things and take risks often
	B	B. Focused on the creation of a stable and predictable environment

SECTION B: RTC QUESTIONNAIRE

Listed below are several statements regarding one's general beliefs and attitudes towards change. Please indicate the degree to which you agree or disagree with each statement by selecting the appropriate number on the scale next to it. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.

Statement	Strongly disagree	Disagree	Inclined to disagree	Inclined to agree	Agree	Strongly agree
1. I generally consider changes to be a negative thing.	**1**	**2**	**3**	**4**	**5**	**6**
2. I'll take a routine day over a day full of unexpected events any time.	**1**	**2**	**3**	**4**	**5**	**6**
3. I like to do the same old things rather than try new and different ones.	**1**	**2**	**3**	**4**	**5**	**6**
4. Whenever my life forms a stable routine, I look for ways to change it.	**1**	**2**	**3**	**4**	**5**	**6**
5. I'd rather be bored than surprised.	**1**	**2**	**3**	**4**	**5**	**6**
6. If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed.	**1**	**2**	**3**	**4**	**5**	**6**
7. When I am informed of a change of plans, I tense up a bit.	**1**	**2**	**3**	**4**	**5**	**6**
8. When things don't go according to plans, it stresses me out.	**1**	**2**	**3**	**4**	**5**	**6**
9. If my boss changed the performance evaluation criteria, it would probably make me feel uncomfortable even if I thought I'd do just as well without having to do extra work.	**1**	**2**	**3**	**4**	**5**	**6**
10. Changing plans seems like a real hassle to me.	**1**	**2**	**3**	**4**	**5**	**6**
11. Often, I feel a bit uncomfortable even about changes that may potentially improve my life.	**1**	**2**	**3**	**4**	**5**	**6**

12. When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.	**1**	**2**	**3**	**4**	**5**	**6**
13. I sometimes find myself avoiding changes that I know will be good for me.	**1**	**2**	**3**	**4**	**5**	**6**
14. I often change my mind.	**1**	**2**	**3**	**4**	**5**	**6**
15. I don't change my mind.	**1**	**2**	**3**	**4**	**5**	**6**
16. Once I've come to a conclusion, I'm not likely to change my mind.	**1**	**2**	**3**	**4**	**5**	**6**
17. My views are very consistent over time.	**1**	**2**	**3**	**4**	**5**	**6**

APPENDIX B – ANOVA AGE

ANOVA: OMNIBUS TEST

Variable	Analysis of Variance (Bullock 6) Marked effects are significant at p < .05000 SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	131.9573	3	43.98577	2888.984	64	45.14037	0.974422	0.410407
TM_T	131.9573	3	43.98577	2888.984	64	45.14037	0.974422	0.410407
RTC_RS	1.4306	3	0.47686	34.828	69	0.50475	0.944746	0.423909
RTC_ER	3.4605	3	1.15348	51.456	69	0.74574	1.546760	0.210241
RTC_STF	1.6427	3	0.54757	54.015	69	0.78282	0.699480	0.555559
RTC_CR	2.4299	3	0.80998	48.005	69	0.69573	1.164214	0.329748
RTC	1.1711	3	0.39035	22.169	69	0.32128	1.214972	0.310864

NONPARAMETRIC KRUSKAL-WALLIS TEST: OMNIBUS TEST AND P-VALUES OF POST HOC TESTS (PAIRWISE COMPARISONS)

Depend.: MM_T	Multiple Comparisons p values (2-tailed); MM_T (Bu Independent (grouping) variable: AGE_50_UP_COM Kruskal-Wallis test: H (3, N= 68) =4.137988 p =.24 20-29 R:30.818	30-39 R:29.636	40-49 R:41.667	50 and older R:35.588
20-29		1.000000	0.910196	1.000000
30-39	1.000000		0.333505	1.000000
40-49	0.910196	0.333505		1.000000
50 and older	1.000000	1.000000	1.000000	

Depend.: TM_T	Multiple Comparisons p values (2-tailed); TM_T (Bullock 6 Independent (grouping) variable: AGE_50_UP_COMBINEI Kruskal-Wallis test: H (3, N= 68) =4.137988 p =.2469 20-29 R:38.182	30-39 R:39.364	40-49 R:27.333	50 and older R:33.412
20-29		1.000000	0.910196	1.000000
30-39	1.000000		0.333505	1.000000
40-49	0.910196	0.333505		1.000000
50 and older	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_RS (Bullock 6) Independent (grouping) variable: AGE_50_UP_COMBINED Kruskal-Wallis test: H (3, N= 73) =2.419809 p =.4900			
Depend.: RTC_RS	20-29 R:43.000	30-39 R:39.630	40-49 R:32.700	50 and older R:34.417
20-29		1.000000	1.000000	1.000000
30-39	1.000000		1.000000	1.000000
40-49	1.000000	1.000000		1.000000
50 and older	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_ER (Bullock 6) Independent (grouping) variable: AGE_50_UP_COMBINED Kruskal-Wallis test: H (3, N= 73) =4.090741 p =.2518			
Depend.: RTC_ER	20-29 R:27.667	30-39 R:42.022	40-49 R:34.725	50 and older R:39.333
20-29		0.344648	1.000000	0.840539
30-39	0.344648		1.000000	1.000000
40-49	1.000000	1.000000		1.000000
50 and older	0.840539	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_STF (Bullock 6) Independent (grouping) variable: AGE_50_UP_COMBINED Kruskal-Wallis test: H (3, N= 73) =2.604320 p =.4567			
Depend.: RTC_STF	20-29 R:30.875	30-39 R:42.304	40-49 R:35.800	50 and older R:35.639
20-29		0.782122	1.000000	1.000000
30-39	0.782122		1.000000	1.000000
40-49	1.000000	1.000000		1.000000
50 and older	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_CR (Bullock 6) Independent (grouping) variable: AGE_50_UP_COMBINED Kruskal-Wallis test: H (3, N= 73) =2.795361 p =.4243			
Depend.: RTC_CR	20-29 R:35.500	30-39 R:42.304	40-49 R:31.650	50 and older R:37.167
20-29		1.000000	1.000000	1.000000
30-39	1.000000		0.603015	1.000000
40-49	1.000000	0.603015		1.000000
50 and older	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC (Bullock 6) Independent (grouping) variable: AGE_50_UP_COMBINED Kruskal-Wallis test: H (3, N= 73) =3.263948 p =.3527			
Depend.: RTC	20-29 R:32.875	30-39 R:43.478	40-49 R:33.450	50 and older R:35.417
20-29		0.963033	1.000000	1.000000
30-39	0.963033		0.732761	1.000000
40-49	1.000000	0.732761		1.000000
50 and older	1.000000	1.000000	1.000000	

APPENDIX C – ANOVA (AGE EFFECT SIZES)

PARAMETRIC EFFECT SIZES (COHEN'S D-VALUES)

MM_T	MM_T	MM_T
30.90083	11	5.388456
30.68182	22	6.198205
34.11111	18	6.371314
32.11765	17	8.298210

EFFECT SIZES

	{1}	{2}	{3}	{4}
20-29 {1}				
30-39 {2}	0.04			
40-49 {3}	0.50	0.54		
50 and older {4}	0.15	0.17	0.24	

TM_T	TM_T	TM_T
29.09917	11	5.388456
29.31818	22	6.198205
25.88889	18	6.371314
27.88235	17	8.298210

	{1}	{2}	{3}	{4}
20-29 {1}				
30-39 {2}	0.04			
40-49 {3}	0.50	0.54		
50 and older {4}	0.15	0.17	0.24	

RTC_RS	RTC_RS	RTC_RS
2.616667	12	0.710740
2.478261	23	0.759759
2.243333	20	0.782939
2.283333	18	0.538243

	{1}	{2}	{3}	{4}
20-29 {1}				
30-39 {2}	0.18			
40-49 {3}	0.48	0.30		
50 and older {4}	0.47	0.26	0.05	

RTC_ER	RTC_ER	RTC_ER
2.652778	12	0.943367
3.282609	23	0.867023
3.012500	20	0.844779
3.194444	18	0.824958

	{1}	{2}	{3}	{4}
20-29 {1}				
30-39 {2}	0.67			
40-49 {3}	0.38	0.31		
50 and older {4}	0.57	0.10	0.22	

RTC_STF	RTC_STF	RTC_STF
2.354167	12	0.950229
2.771739	23	0.808032
2.537500	20	0.957227
2.486111	18	0.850917

	{1}	{2}	{3}	{4}
20-29 {1}				
30-39 {2}	0.44			
40-49 {3}	0.19	0.24		
50 and older {4}	0.14	0.34	0.05	

RTC_CR	RTC_CR	RTC_CR
3.416667	12	0.943478
3.768116	23	0.795329
3.312500	20	0.966120
3.481482	18	0.621349

	{1}	{2}	{3}	{4}
20-29 {1}				
30-39 {2}	0.37			
40-49 {3}	0.11	0.47		
50 and older {4}	0.07	0.36	0.17	

RTC	RTC	RTC
2.746936	12	0.621467
3.039802	23	0.484063
2.747964	20	0.672800
2.824088	18	0.494958

	{1}	{2}	{3}	{4}
20-29 {1}				
30-39 {2}	0.47			
40-49 {3}	0.00	0.43		
50 and older {4}	0.12	0.44	0.11	

NONPARAMETRIC EFFECT SIZES

	20-29	30-39	40-49	50 and older
20-29		0.161850	1.433555	0.623414
30-39	0.161850		1.914281	0.932113
40-49	1.433555	1.914281		0.908929
50 and older	0.623414	0.932113	0.908929	

68

EFFECT SIZES

	1	2	3	4
1				
2	0.02			
3	0.17	0.23		
4	0.08	0.11	0.11	

	20-29	30-39	40-49	50 and older
20-29		0.161850	1.433555	0.623414
30-39	0.161850		1.914281	0.932113
40-49	1.433555	1.914281		0.908929
50 and older	0.623414	0.932113	0.908929	

68

	1	2	3	4
1				
2	0.02			
3	0.17	0.23		
4	0.08	0.11	0.11	

	20-29	30-39	40-49	50 and older
20-29		0.445972	1.329478	1.085514
30-39	0.445972		1.068362	0.780860
40-49	1.329478	1.068362		0.249034
50 and older	1.085514	0.780860	0.249034	

73

	1	2	3	4
1				
2	0.05			
3	0.16	0.13		
4	0.13	0.09	0.03	

	20-29	30-39	40-49	50 and older

73

	1	2	3	4

20-29		1.899937	0.911058	1.475456
30-39	1.899937		1.124830	0.402640
40-49	0.911058	1.124830		0.668523
50 and older	1.475456	0.402640	0.668523	

1				
2	0.22			
3	0.11	0.13		
4	0.17	0.05	0.08	

	20-29	30-39	40-49	50 and older
20-29		1.512709	0.635697	0.602478
30-39	1.512709		1.002679	0.998278
40-49	0.635697	1.002679		0.023372
50 and older	0.602478	0.998278	0.023372	

73

	1	2	3	4
1				
2	0.18			
3	0.07	0.12		
4	0.07	0.12	0.00	

	20-29	30-39	40-49	50 and older
20-29		0.900576	0.496941	0.210779
30-39	0.900576		1.642423	0.769465
40-49	0.496941	1.642423		0.800294
50 and older	0.210779	0.769465	0.800294	

73

	1	2	3	4
1				
2	0.11			
3	0.06	0.19		
4	0.02	0.09	0.09	

	20-29	30-39	40-49	50 and older
20-29		1.403374	0.074218	0.321439
30-39	1.403374		1.545908	1.207376
40-49	0.074218	1.545908		0.285301
50 and older	0.321439	1.207376	0.285301	

73

	1	2	3	4
1				
2	0.16			
3	0.01	0.18		
4	0.04	0.14	0.03	

APPENDIX D – ANOVA POSITION

ANOVA:
OMNI

Variable	Analysis of Variance (Bullock 6) Marked effects are significant at p < .05000							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	327.9463	2	163.9732	2688.870	64	42.01359	3.902860	0.025158
TM_T	327.9463	2	163.9732	2688.870	64	42.01359	3.902860	0.025158
RTC_RS	4.7438	2	2.3719	31.478	69	0.45621	5.199177	0.007885
RTC_ER	4.1504	2	2.0752	48.224	69	0.69891	2.969245	0.057939
RTC_STF	1.6691	2	0.8345	51.494	69	0.74629	1.118229	0.332708
RTC_CR	4.3233	2	2.1617	44.490	69	0.64478	3.352563	0.040782
RTC	2.0277	2	1.0139	20.099	69	0.29129	3.480567	0.036299

NONPARAMETRIC KRUSKAL-WALLIS TEST: OMNIBUS TEST AND P-VALUES OF POST HOC TESTS (PAIRWISE COMPARISONS)

Depend.: MM_T	Multiple Comparisons p values (2-tailed); MM_T (Bulloc Independent (grouping) variable: POSITION Kruskal-Wallis test: H (2, N= 67) =7.969862 p =.0186		
	1 R:39.514	2 R:30.556	3 R:22.167
1		0.328934	0.022096
2	0.328934		0.743985
3	0.022096	0.743985	

Depend.: TM_T	Multiple Comparisons p values (2-tailed); TM_T (Bulloc Independent (grouping) variable: POSITION Kruskal-Wallis test: H (2, N= 67) =7.969862 p =.0186		
	1 R:28.486	2 R:37.444	3 R:45.833
1		0.328934	0.022096
2	0.328934		0.743985
3	0.022096	0.743985	

	Multiple Comparisons p values (2-tailed); RTC_RS (Bul Independent (grouping) variable: POSITION Kruskal-Wallis test: H (2, N= 72) =9.842681 p =.0073		
Depend.: RTC_RS	1 R:30.527	2 R:37.025	3 R:50.533
1		0.789786	0.005370
2	0.789786		0.176397
3	0.005370	0.176397	

	Multiple Comparisons p values (2-tailed); RTC_ER (Bullock 6 Independent (grouping) variable: POSITION Kruskal-Wallis test: H (2, N= 72) =5.630416 p =.0599		
Depend.: RTC_ER	1 R:30.932	2 R:41.025	3 R:44.200
1		0.246858	0.115051
2	0.246858		1.000000
3	0.115051	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_STF (Bulloc Independent (grouping) variable: POSITION Kruskal-Wallis test: H (2, N= 72) =2.338687 p =.3106		
Depend.: RTC_STF	1 R:33.892	2 R:36.000	3 R:43.600
1		1.000000	0.388973
2	1.000000		0.863113
3	0.388973	0.863113	

	Multiple Comparisons p values (2-tailed); RTC_CR (Bul Independent (grouping) variable: POSITION Kruskal-Wallis test: H (2, N= 72) =5.339338 p =.0693		
Depend.: RTC_CR	1 R:33.284	2 R:45.625	3 R:32.267
1		0.100833	1.000000
2	0.100833		0.184990
3	1.000000	0.184990	

| | Multiple Comparisons p values (2-tailed); RTC (Bullock
Independent (grouping) variable: POSITION
Kruskal-Wallis test: H (2, N= 72) =7.111648 p =.0286 | | |
|---|---|---|---|
| Depend.:
RTC | 1
R:30.284 | 2
R:41.175 | 3
R:45.600 |
| 1 | | 0.182349 | 0.050423 |
| 2 | 0.182349 | | 1.000000 |
| 3 | 0.050423 | 1.000000 | |

APPENDIX E (POSITION EFFECT SIZES)

PARAMETRIC EFFECT SIZES (COHEN'S D-VALUES)

	MM_T	MM_T	MM_T
1	33.83047	37	6.842588
2	30.54545	18	6.873749
3	28.28030	12	4.264976

EFFECT SIZES

		{1}	{2}	{3}
1	{1}			
2	{2}	0.48		
3	{3}	0.81	0.33	

	TM_T	TM_T	TM_T
1	26.16953	37	6.842588
2	29.45455	18	6.873749
3	31.71970	12	4.264976

		{1}	{2}	{3}
1	{1}			
2	{2}	0.48		
3	{3}	0.81	0.33	

	RTC_RS	RTC_RS	RTC_RS
1	2.200000	37	0.705534
2	2.388333	20	0.651519
3	2.866667	15	0.626403

		{1}	{2}	{3}
1	{1}			
2	{2}	0.27		
3	{3}	0.94	0.73	

	RTC_ER	RTC_ER	RTC_ER
1	2.878378	37	0.817817
2	3.275000	20	1.012748
3	3.438889	15	0.576892

		{1}	{2}	{3}
1	{1}			
2	{2}	0.39		
3	{3}	0.69	0.16	

	RTC_STF	RTC_STF	RTC_STF
1	2.493243	37	0.872987
2	2.550000	20	0.894427
3	2.883333	15	0.795448

		{1}	{2}	{3}
1	{1}			
2	{2}	0.06		
3	{3}	0.45	0.37	

	RTC_CR	RTC_CR	RTC_CR
1	3.416667	37	0.687184
2	3.920833	20	1.012161
3	3.300000	15	0.757109

		{1}	{2}	{3}
1	{1}			
2	{2}	0.50		
3	{3}	0.15	0.61	

	RTC	RTC	RTC
1	2.714527	37	0.580341
2	2.995893	20	0.534558
3	3.103431	15	0.426366

		{1}	{2}	{3}
1	{1}			
2	{2}	0.48		
3	{3}	0.67	0.20	

NONPARAMETRIC EFFECT SIZES

	1	2	3
1		1.599792	2.679864
2	1.599792		1.155233
3	2.679864	1.155233	

	1	2	3
1		1.599792	2.679864
2	1.599792		1.155233
3	2.679864	1.155233	

	1	2	3
1		1.118715	3.123019
2	1.118715		1.889693
3	3.123019	1.889693	

	1	2	3
1		1.737573	2.071090
2	1.737573		0.444154
3	2.071090	0.444154	

	1	2	3
1		0.362940	1.515453
2	0.362940		1.063171
3	1.515453	1.063171	

EFFECT SIZES

67

	1	2	3
1			
2	0.20		
3	0.33	0.14	

67

	1	2	3
1			
2	0.20		
3	0.33	0.14	

72

	1	2	3
1			
2	0.13		
3	0.37	0.22	

72

	1	2	3
1			
2	0.20		
3	0.24	0.05	

72

	1	2	3
1			
2	0.04		
3	0.18	0.13	

	1	2	3
1		2.124708	0.158774
2	2.124708		1.868710
3	0.158774	1.868710	

72

	1	2	3
1			
2	0.25		
3	0.02	0.22	

	1	2	3
1		1.875071	2.390888
2	1.875071		0.619017
3	2.390888	0.619017	

72

	1	2	3
1			
2	0.22		
3	0.28	0.07	

APPENDIX F – ANOVA SCHOOL

ANOVA: OMNIBUS TEST

Variable	Analysis of Variance (Bullock 6) Marked effects are significant at p < .05000							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	60.55526	3	20.18509	2799.569	62	45.15433	0.447024	0.720275
TM_T	60.55526	3	20.18509	2799.569	62	45.15433	0.447024	0.720275
RTC_RS	1.24854	3	0.41618	34.814	67	0.51961	0.800951	0.497700
RTC_ER	3.45108	3	1.15036	51.112	67	0.76287	1.507941	0.220466
RTC_STF	0.02416	3	0.00805	55.300	67	0.82537	0.009755	0.998666
RTC_CR	0.61544	3	0.20515	49.150	67	0.73358	0.279651	0.839897
RTC	0.42255	3	0.14085	22.689	67	0.33864	0.415922	0.742127

NONPARAMETRIC KRUSKAL-WALLIS TEST: OMNIBUS TEST AND P-VALUES OF POST HOC TESTS (PAIRWISE COMPARISONS)

Depend.: MM_T	Multiple Comparisons p values (2-tailed); MM_T (Bullock 6) Independent (grouping) variable: SCHOOL Kruskal-Wallis test: H (3, N= 66) =1.359160 p =.7151			
	1 R:31.913	2 R:32.882	3 R:39.950	4 R:32.406
1		1.000000	1.000000	1.000000
2	1.000000		1.000000	1.000000
3	1.000000	1.000000		1.000000
4	1.000000	1.000000	1.000000	

Depend.: TM_T	Multiple Comparisons p values (2-tailed); TM_T (Bulloc Independent (grouping) variable: SCHOOL Kruskal-Wallis test: H (3, N= 66) =1.359160 p =.7151			
	1 R:35.087	2 R:34.118	3 R:27.050	4 R:34.594
1		1.000000	1.000000	1.000000
2	1.000000		1.000000	1.000000
3	1.000000	1.000000		1.000000
4	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_RS (Bul Independent (grouping) variable: SCHOOL Kruskal-Wallis test: H (3, N= 71) =2.419589 p =.4900			
Depend.: RTC_RS	1 R:40.673	2 R:33.447	3 R:30.400	4 R:34.938
1		1.000000	1.000000	1.000000
2	1.000000		1.000000	1.000000
3	1.000000	1.000000		1.000000
4	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_ER (Bul Independent (grouping) variable: SCHOOL Kruskal-Wallis test: H (3, N= 71) =5.054645 p =.1678			
Depend.: RTC_ER	1 R:41.923	2 R:29.711	3 R:29.550	4 R:37.875
1		0.299650	0.643016	1.000000
2	0.299650		1.000000	1.000000
3	0.643016	1.000000		1.000000
4	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_STF (B Independent (grouping) variable: SCHOOL Kruskal-Wallis test: H (3, N= 71) =.2653454 p =.9664			
Depend.: RTC_STF	1 R:37.173	2 R:36.526	3 R:33.750	4 R:34.875
1		1.000000	1.000000	1.000000
2	1.000000		1.000000	1.000000
3	1.000000	1.000000		1.000000
4	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC_CR (Bul Independent (grouping) variable: SCHOOL Kruskal-Wallis test: H (3, N= 71) =1.046656 p =.7900			
Depend.: RTC_CR	1 R:35.673	2 R:36.158	3 R:41.400	4 R:32.969
1		1.000000	1.000000	1.000000
2	1.000000		1.000000	1.000000
3	1.000000	1.000000		1.000000
4	1.000000	1.000000	1.000000	

	Multiple Comparisons p values (2-tailed); RTC (Bullock Independent (grouping) variable: SCHOOL Kruskal-Wallis test: H (3, N= 71) =1.597046 p =.6601			
Depend.: RTC	1 R:39.962	2 R:34.474	3 R:32.150	4 R:33.781
1		1.000000	1.000000	1.000000
2	1.000000		1.000000	1.000000
3	1.000000	1.000000		1.000000
4	1.000000	1.000000	1.000000	

APPENDIX G ANOVA (SCHOOL EFFECT SIZES)

PARAMETRIC EFFECT SIZES (COHEN'S D-VALUES)

MM_T	MM_T	MM_T
31.78261	23	7.372902
31.96791	17	6.775239
34.50000	10	4.949747
31.77841	16	6.576188

EFFECT SIZES

		{1}	{2}	{3}	{4}
1	{1}				
2	{2}	0.03			
3	{3}	0.37	0.37		
4	{4}	0.00	0.03	0.41	

TM_T	TM_T	TM_T
28.21739	23	7.372902
28.03209	17	6.775239
25.50000	10	4.949747
28.22159	16	6.576188

		{1}	{2}	{3}	{4}
1	{1}				
2	{2}	0.03			
3	{3}	0.37	0.37		
4	{4}	0.00	0.03	0.41	

RTC_RS	RTC_RS	RTC_RS
2.561538	26	0.767373
2.298246	19	0.721921
2.230000	10	0.705612
2.325000	16	0.644464

		{1}	{2}	{3}	{4}
1	{1}				
2	{2}	0.34			
3	{3}	0.43	0.09		
4	{4}	0.31	0.04	0.13	

RTC_ER	RTC_ER	RTC_ER
3.326923	26	0.865359
2.828947	19	0.781970
2.850000	10	0.783511
3.177083	16	1.028247

		{1}	{2}	{3}	{4}
1	{1}				
2	{2}	0.58			
3	{3}	0.55	0.03		
4	{4}	0.15	0.34	0.32	

RTC_STF	RTC_STF	RTC_STF
2.596154	26	1.046606
2.578947	19	0.808173
2.575000	10	0.833750
2.546875	16	0.812500

		{1}	{2}	{3}	{4}
1	{1}				
2	{2}	0.02			
3	{3}	0.02	0.00		
4	{4}	0.05	0.04	0.03	

RTC_CR	RTC_CR	RTC_CR
3.487180	26	0.676466
3.592105	19	0.913671
3.700000	10	0.911348
3.416667	16	1.006920

		{1}	{2}	{3}	{4}
1	{1}				
2	{2}	0.11			
3	{3}	0.23	0.12		
4	{4}	0.07	0.17	0.28	

RTC	RTC	RTC
2.967053	26	0.592722
2.796618	19	0.613130
2.798431	10	0.499025
2.830653	16	0.571446

		{1}	{2}	{3}	{4}
1	{1}				
2	{2}	0.28			
3	{3}	0.28	0.00		
4	{4}	0.23	0.06	0.06	

NONPARAMETRIC EFFECT SIZES

	1	2	3	4
1		0.157871	1.105299	0.078923
2	0.157871		0.923844	0.071205
3	1.105299	0.923844		0.974859
4	0.078923	0.071205	0.974859	

66

EFFECT SIZES

	1	2	3	4
1				
2	0.02			
3	0.14	0.11		
4	0.01	0.01	0.12	

	1	2	3	4
1		0.157871	1.105299	0.078923
2	0.157871		0.923844	0.071205
3	1.105299	0.923844		0.974859
4	0.078923	0.071205	0.974859	

66

	1	2	3	4
1				
2	0.02			
3	0.14	0.11		
4	0.01	0.01	0.12	

	1	2	3	4
1		1.159933	1.337615	0.874570
2	1.159933		0.377918	0.212776
3	1.337615	0.377918		0.545362
4	0.874570	0.212776	0.545362	

71

	1	2	3	4
1				
2	0.14			
3	0.16	0.04		
4	0.10	0.03	0.06	

	1	2	3	4
1		1.960464	1.611047	0.617257
2	1.960464		0.019908	1.165806
3	1.611047	0.019908		1.000582
4	0.617257	1.165806	1.000582	

71

	1	2	3	4
1				
2	0.23			
3	0.19	0.00		
4	0.07	0.14	0.12	

	1	2	3	4
1		0.103824	0.445705	0.350414
2	0.103824		0.344304	0.235791
3	0.445705	0.344304		0.135214
4	0.350414	0.235791	0.135214	

71

	1	2	3	4
1				
2	0.01			
3	0.05	0.04		
4	0.04	0.03	0.02	

	1	2	3	4
1		0.077827	0.745679	0.412360
2	0.077827		0.650098	0.455378
3	0.745679	0.650098		1.013352
4	0.412360	0.455378	1.013352	

71

	1	2	3	4
1				
2	0.01			
3	0.09	0.08		
4	0.05	0.05	0.12	

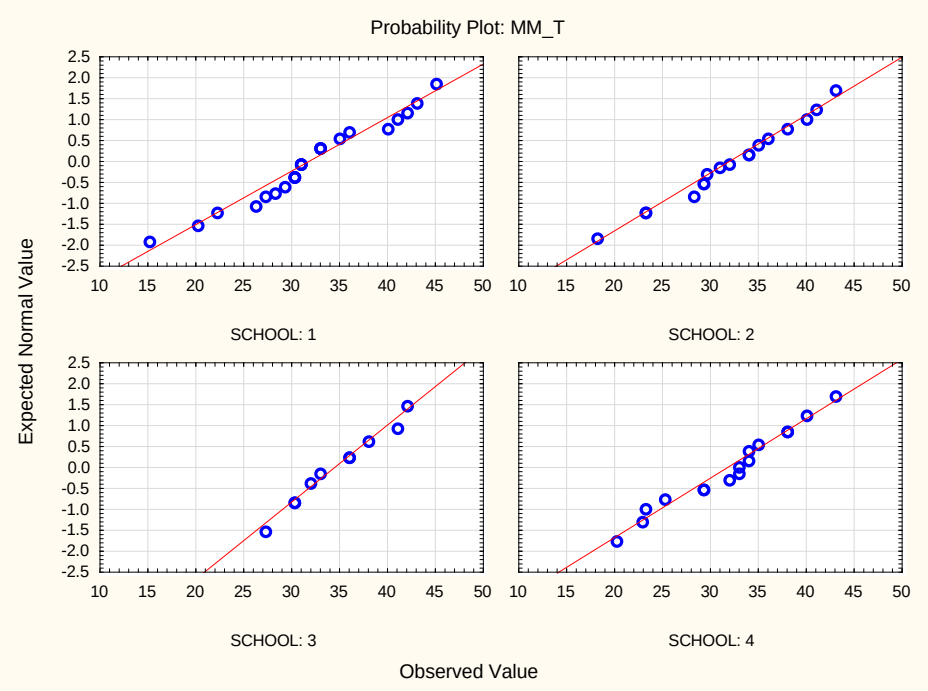
	1	2	3	4
1		0.880958	1.017108	0.942380
2	0.880958		0.288171	0.098873
3	1.017108	0.288171		0.196060
4	0.942380	0.098873	0.196060	

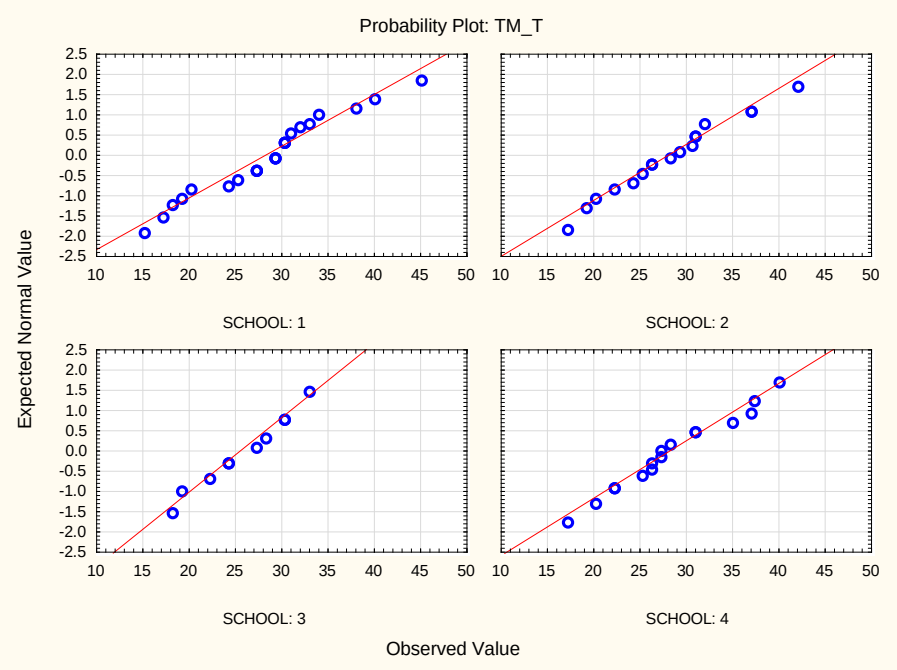
71

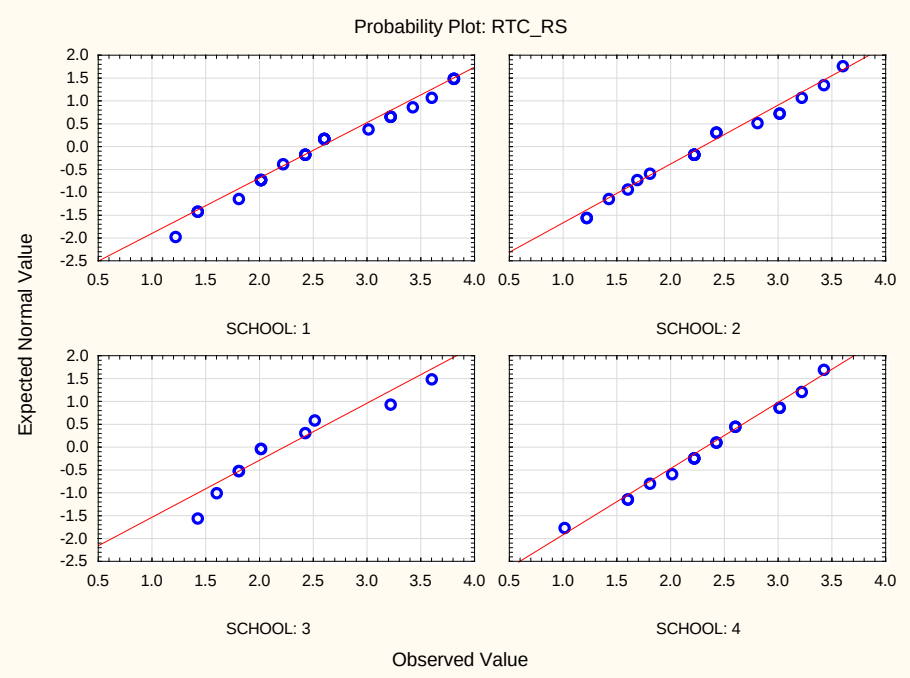
	1	2	3	4
1				
2	0.10			
3	0.12	0.03		
4	0.11	0.01	0.02	

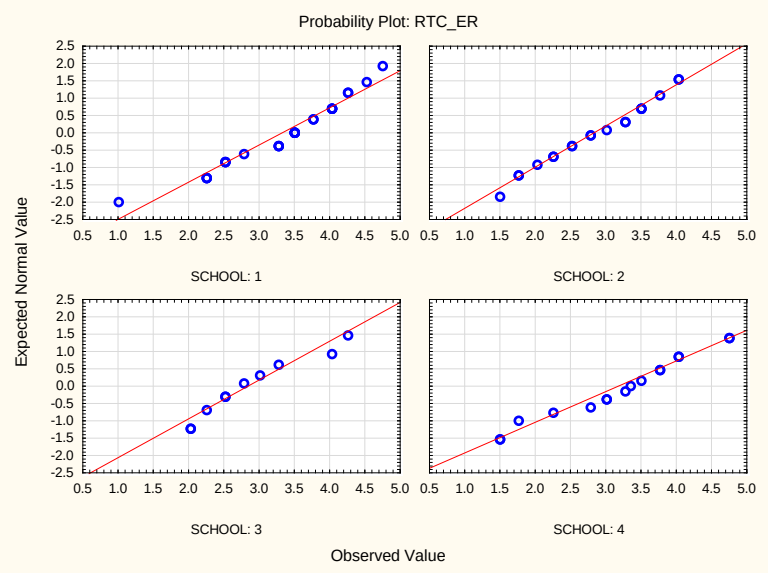
APPENDIX H (TESTING OF ASSUMPTIONS)

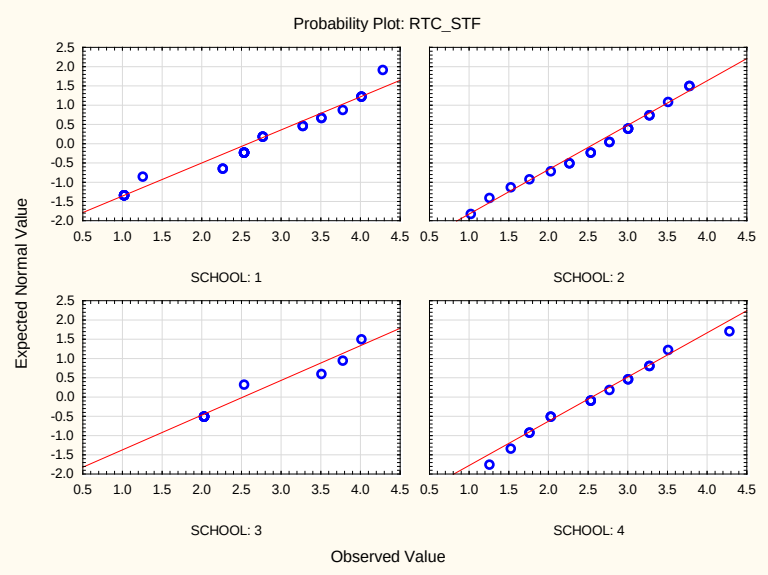
Variable	Levene Test of Homogeneity of Variances (Bullock 6) Marked effects are significant at p < .05000							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	14.31863	3	4.772877	1018.783	62	16.43199	0.290463	0.832120
TM_T	14.31863	3	4.772877	1018.783	62	16.43199	0.290463	0.832120
RTC_RS	0.15341	3	0.051137	11.457	67	0.17101	0.299032	0.825972
RTC_ER	0.29824	3	0.099413	16.372	67	0.24436	0.406824	0.748584
RTC_STF	0.40705	3	0.135683	18.249	67	0.27237	0.498160	0.684812
RTC_CR	0.43423	3	0.144742	17.454	67	0.26050	0.555630	0.646159
RTC	0.07846	3	0.026152	7.352	67	0.10973	0.238330	0.869323

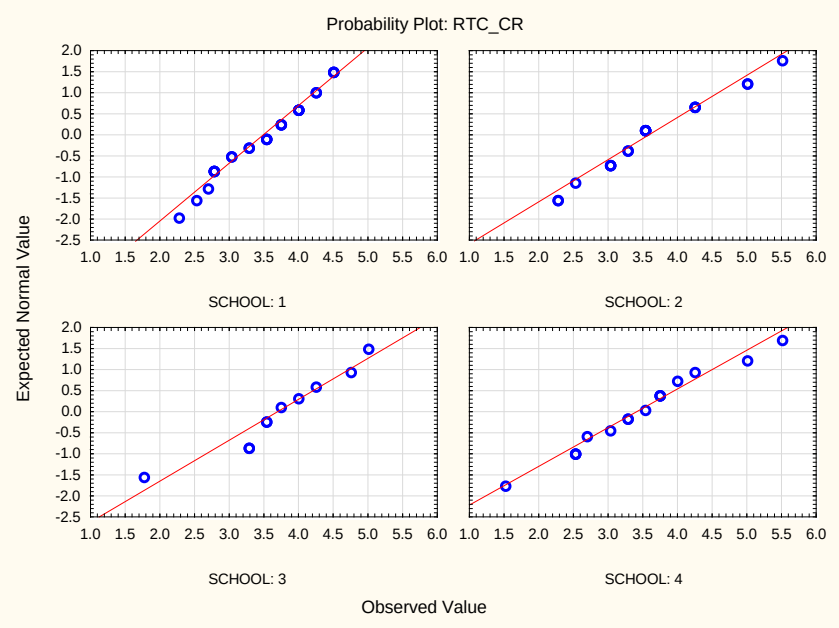


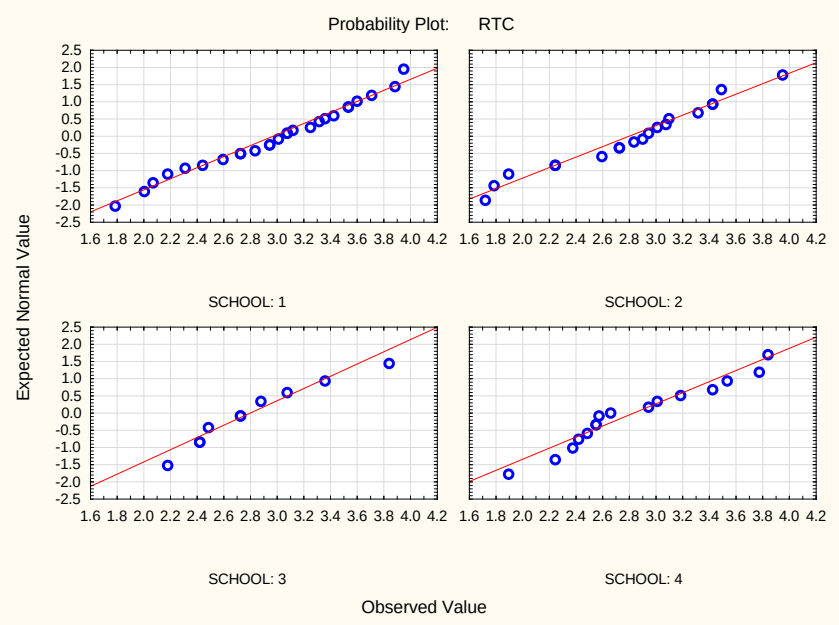

Probability Plot: TM_T
Expected Normal Value
SCHOOL: 1
SCHOOL: 2
SCHOOL: 3
SCHOOL: 4
Observed Value


Probability Plot: RTC_RS
Expected Normal Value
SCHOOL: 1
SCHOOL: 2
SCHOOL: 3
SCHOOL: 4
Observed Value

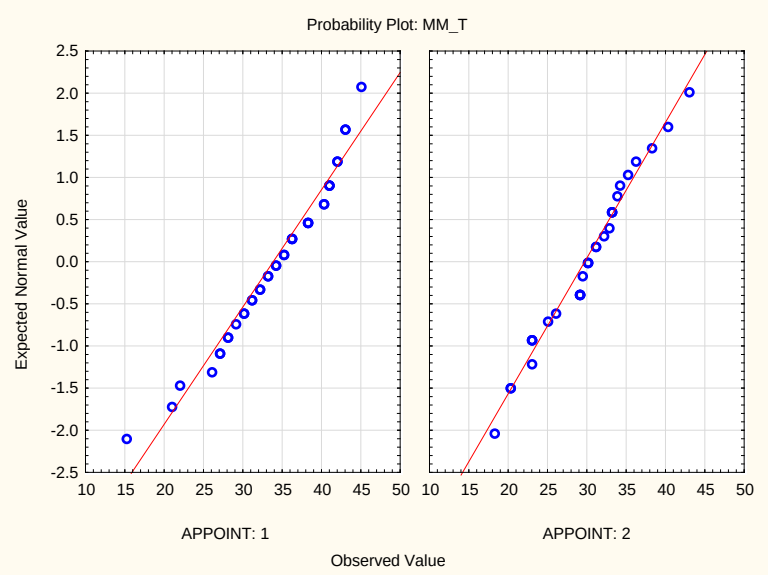

Probability Plot: RTC_ER
Expected Normal Value
SCHOOL: 1
SCHOOL: 2
SCHOOL: 3
SCHOOL: 4
Observed Value

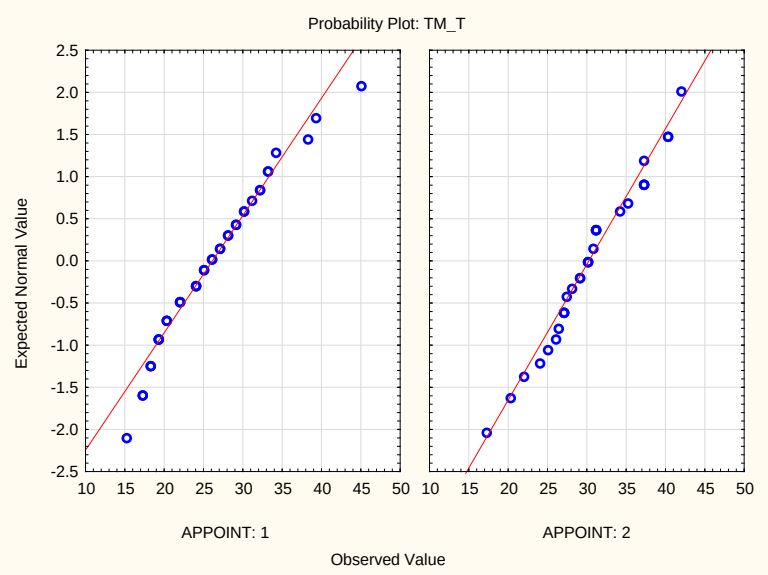

Probability Plot: RTC_STF
Expected Normal Value
SCHOOL: 1
SCHOOL: 2
SCHOOL: 3
SCHOOL: 4
Observed Value

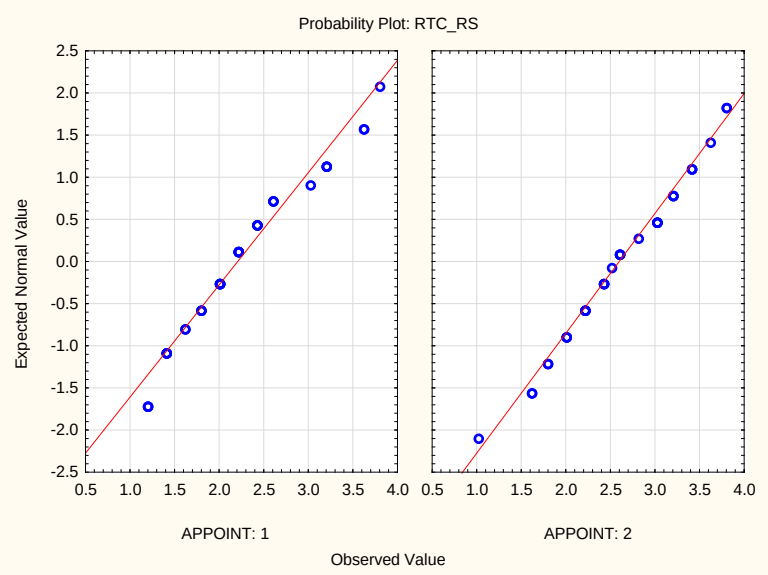

Probability Plot: RTC_CR
Expected Normal Value
SCHOOL: 1
SCHOOL: 2
SCHOOL: 3
SCHOOL: 4
Observed Value

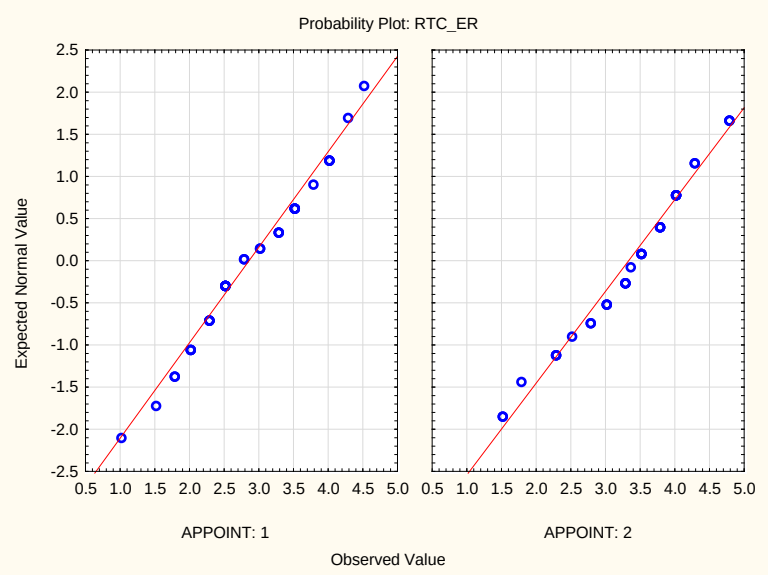

Probability Plot: RTC
Expected Normal Value
SCHOOL: 1
SCHOOL: 2
SCHOOL: 3
SCHOOL: 4
Observed Value

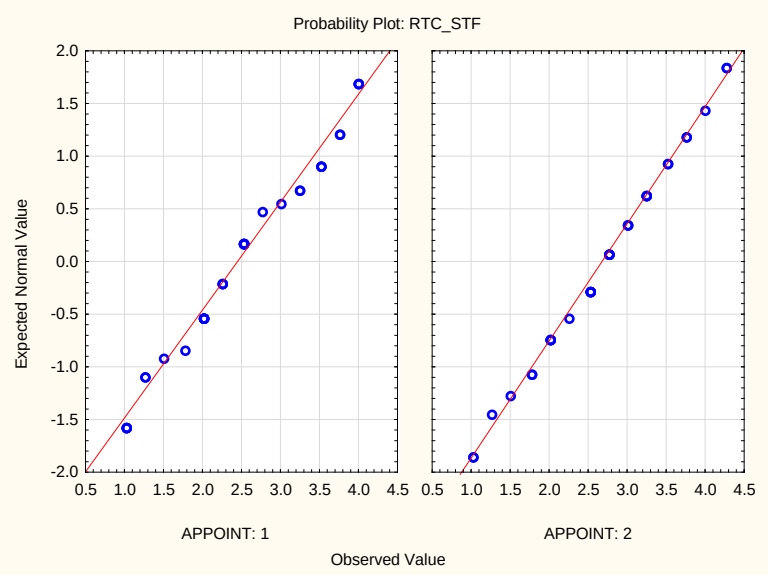
Variable	Levene Test of Homogeneity of Variances (Bullock 6) Marked effects are significant at p < .05000							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	14.53853	1	14.53853	1005.539	66	15.23545	0.954257	0.332205
TM_T	14.53853	1	14.53853	1005.539	66	15.23545	0.954257	0.332205
RTC_RS	0.00017	1	0.00017	11.920	70	0.17029	0.001008	0.974768
RTC_ER	0.02523	1	0.02523	16.153	70	0.23076	0.109341	0.741884
RTC_STF	0.02298	1	0.02298	19.658	70	0.28083	0.081824	0.775686
RTC_CR	0.38884	1	0.38884	17.901	70	0.25573	1.520519	0.221666
RTC	0.14269	1	0.14269	7.953	70	0.11362	1.255866	0.266265

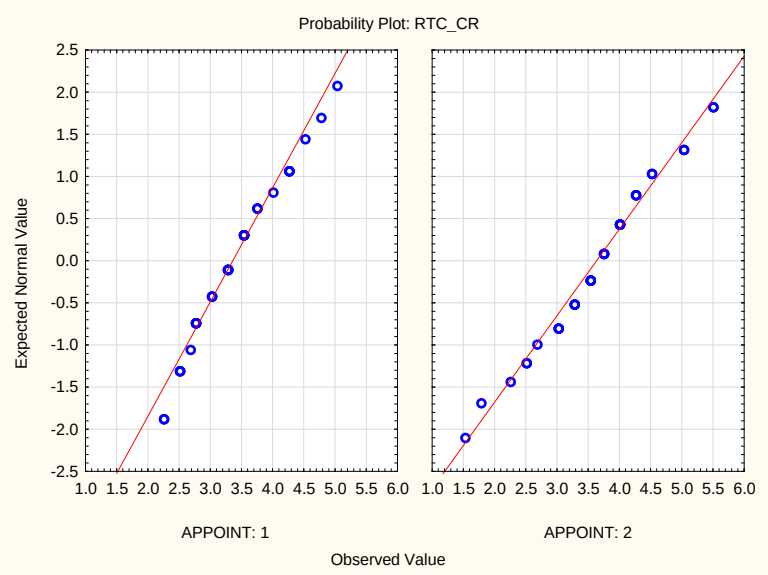


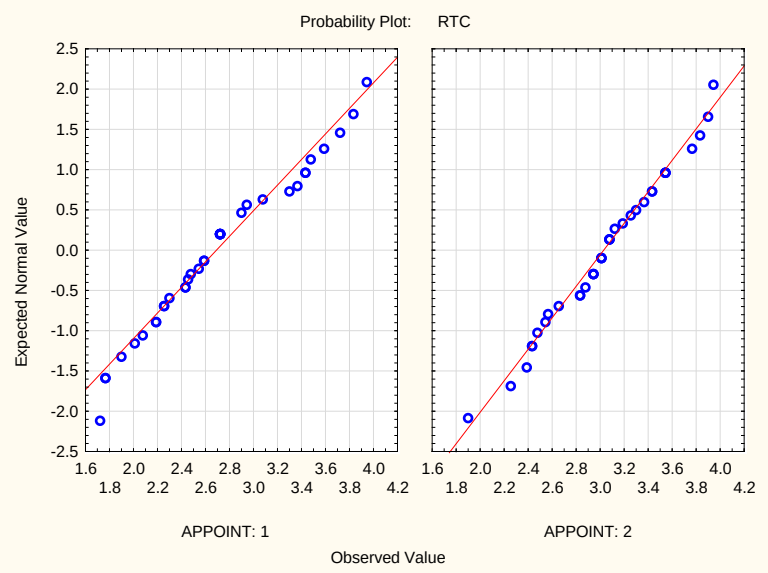



Probability Plot: RTC_RS
Expected Normal Value
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0
APPOINT: 1
APPOINT: 2
Observed Value

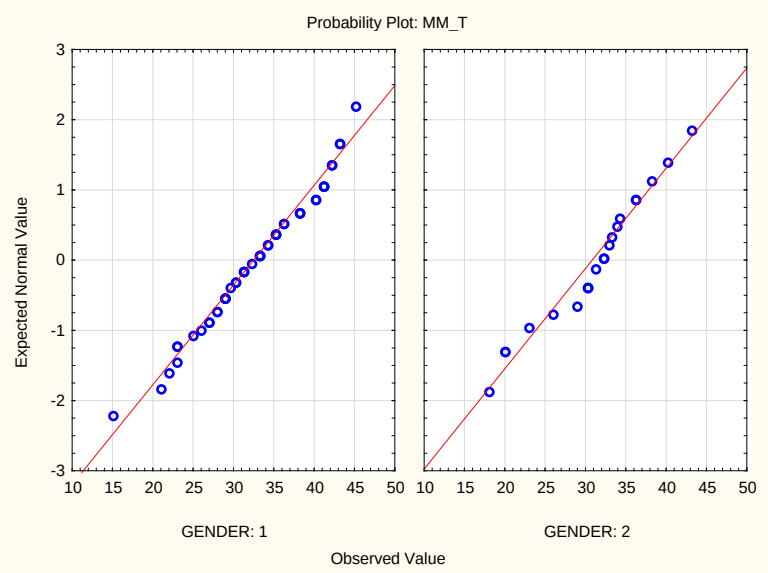

Probability Plot: RTC_ER
Expected Normal Value
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0
APPOINT: 1
APPOINT: 2
Observed Value

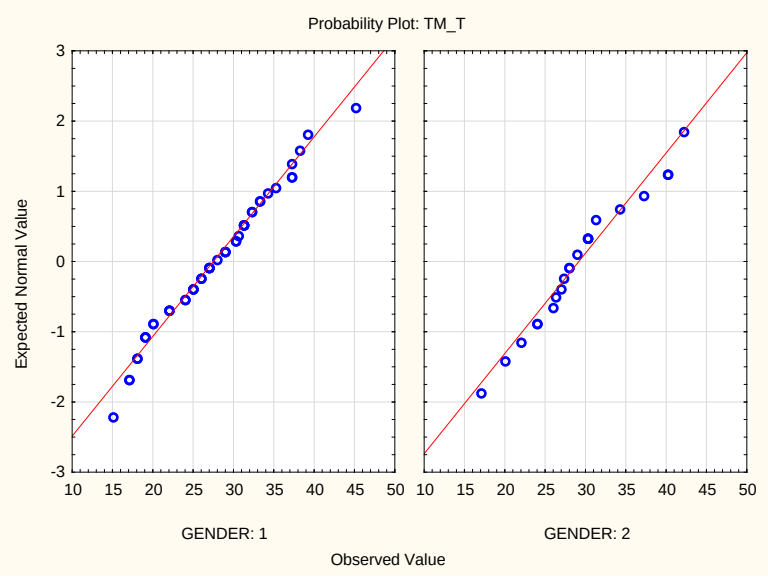

Probability Plot: RTC_STF
Expected Normal Value
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5
APPOINT: 1
APPOINT: 2
Observed Value

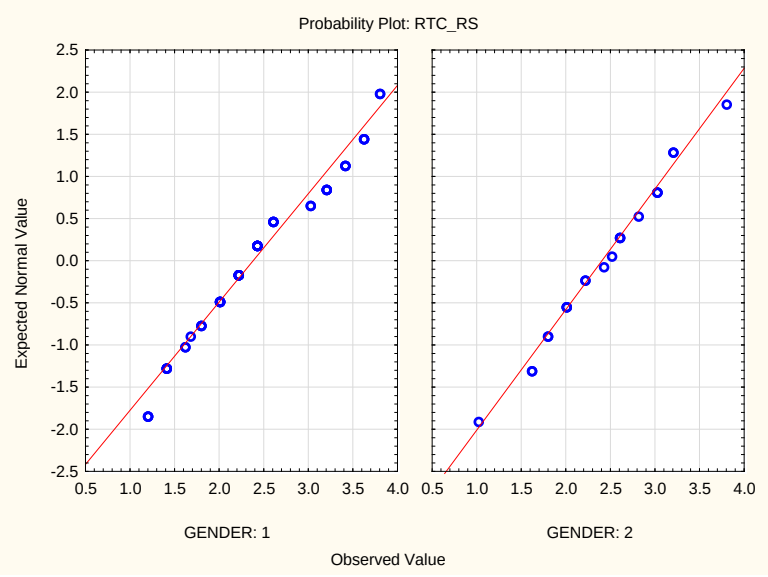

Probability Plot: RTC_CR
Expected Normal Value
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0
1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0
APPOINT: 1
APPOINT: 2
Observed Value

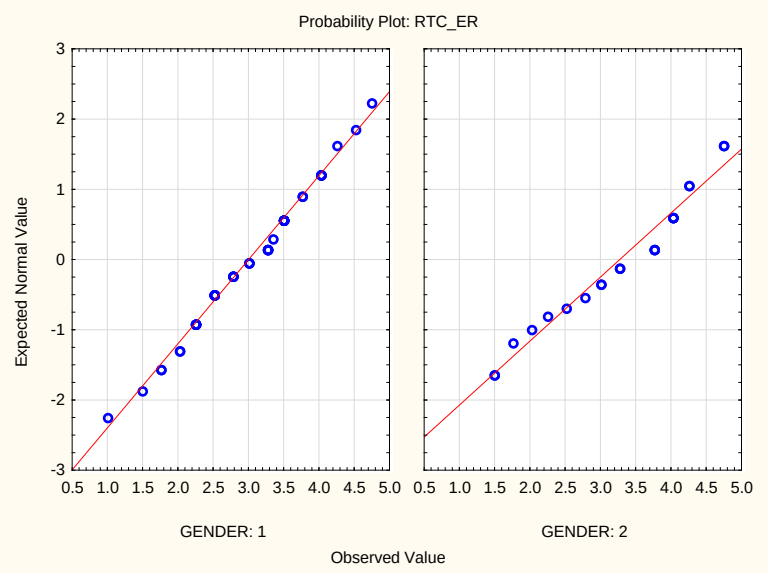


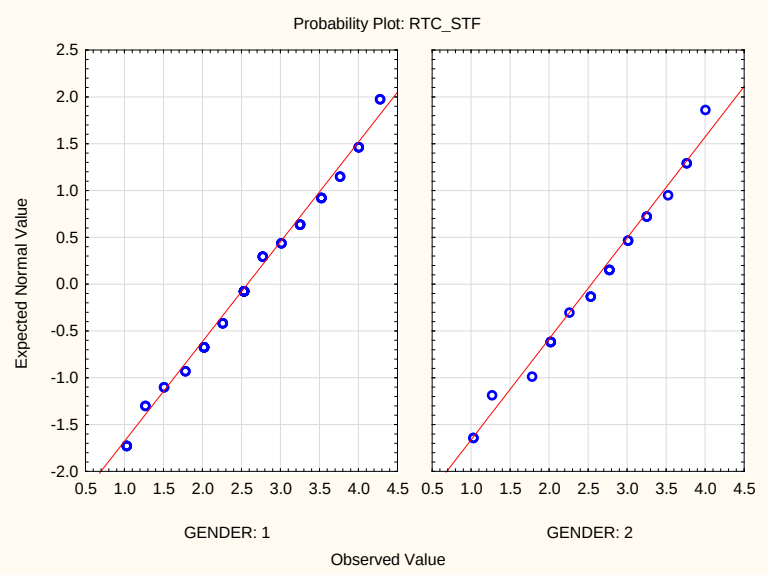
Variable	Levene Test of Homogeneity of Variances (Bullock 6) Marked effects are significant at p < .05000 SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	4.979319	1	4.979319	1057.510	66	16.02288	0.310763	0.579098
TM_T	4.979319	1	4.979319	1057.510	66	16.02288	0.310763	0.579098
RTC_RS	0.052910	1	0.052910	12.245	71	0.17247	0.306782	0.581402
RTC_ER	0.457755	1	0.457755	15.450	71	0.21761	2.103571	0.151359
RTC_STF	0.000444	1	0.000444	19.017	71	0.26785	0.001657	0.967643
RTC_CR	0.090219	1	0.090219	18.201	71	0.25636	0.351926	0.554910
RTC	0.051480	1	0.051480	7.285	71	0.10260	0.501738	0.481056

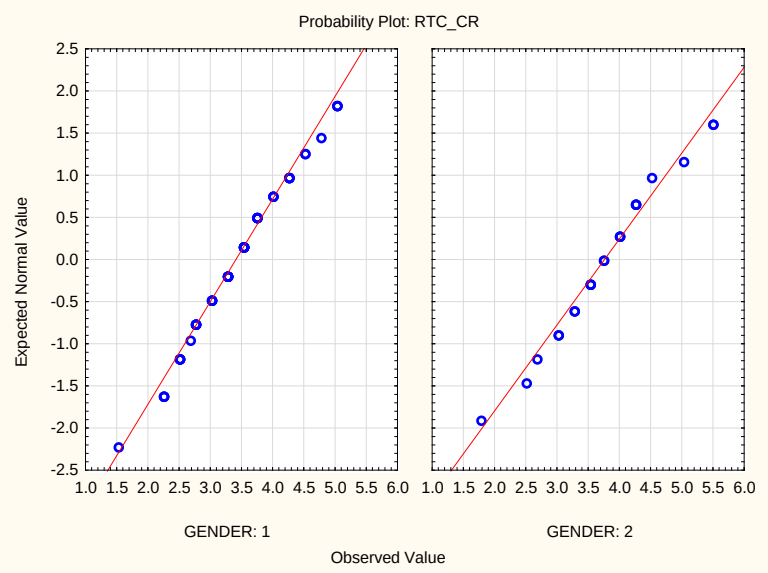


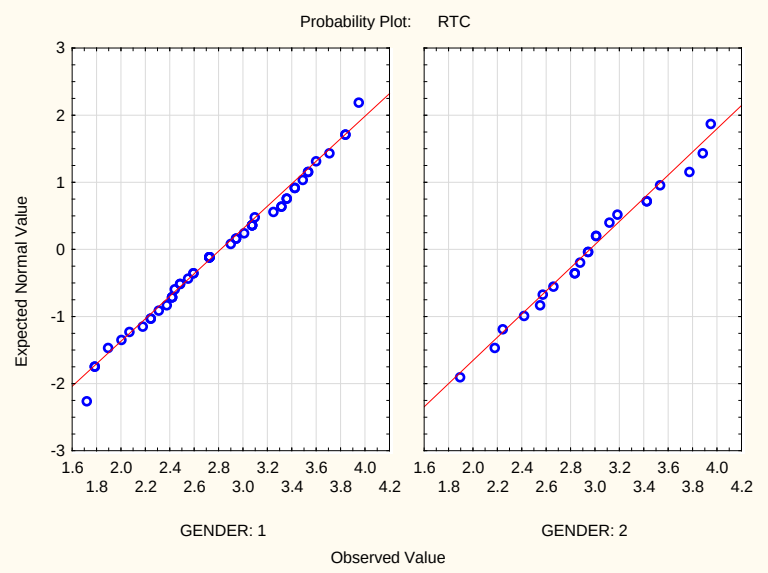

Probability Plot: TM_T
Expected Normal Value
GENDER: 1
GENDER: 2
Observed Value


Probability Plot: RTC_RS
Expected Normal Value
GENDER: 1
GENDER: 2
Observed Value

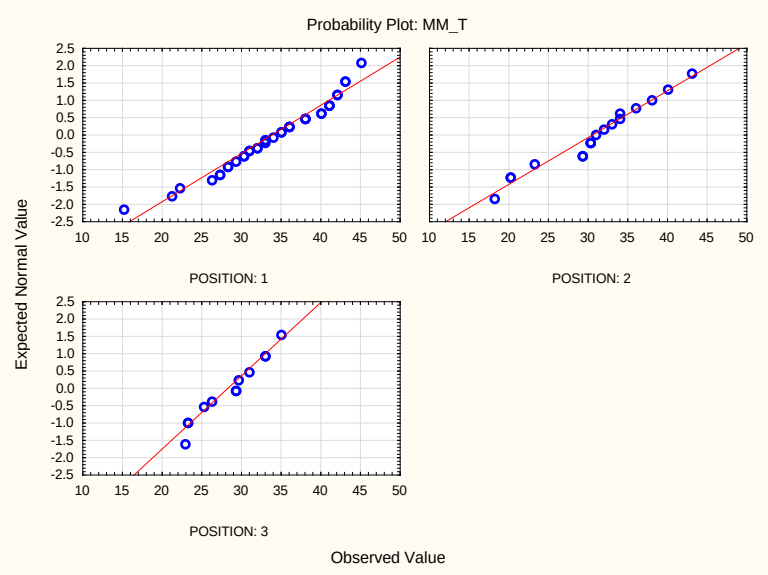

Probability Plot: RTC_ER
Expected Normal Value
3
2
1
0
-1
-2
-3
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0
GENDER: 1
GENDER: 2
Observed Value

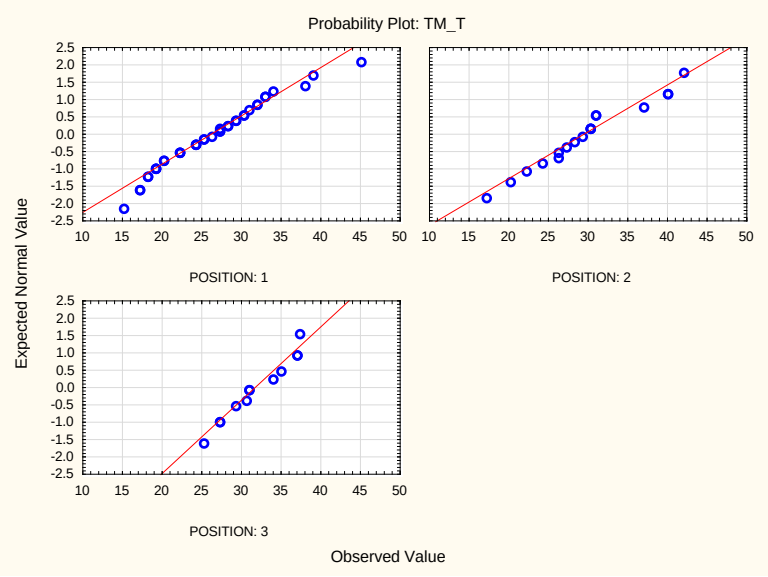

Probability Plot: RTC_STF
Expected Normal Value
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5
GENDER: 1
GENDER: 2
Observed Value

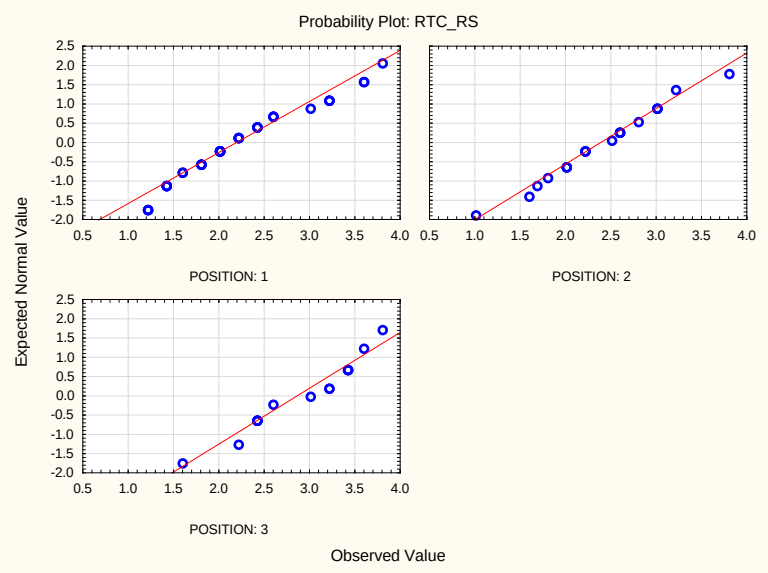


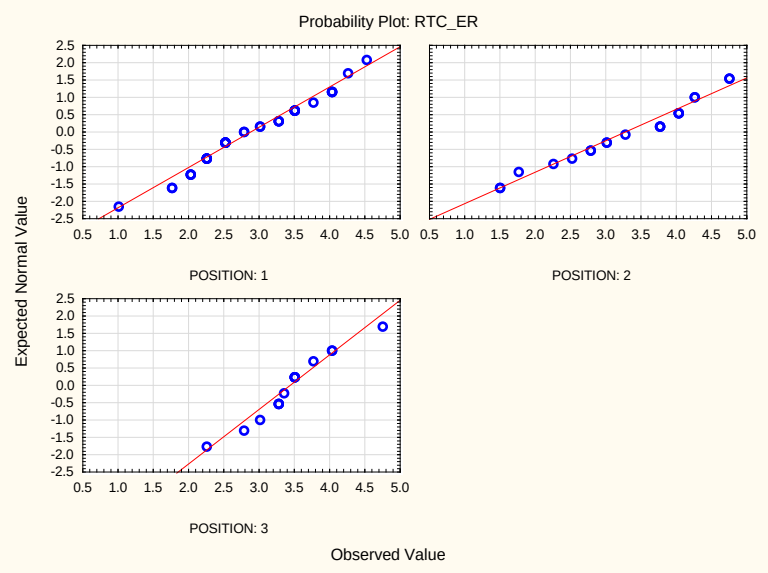


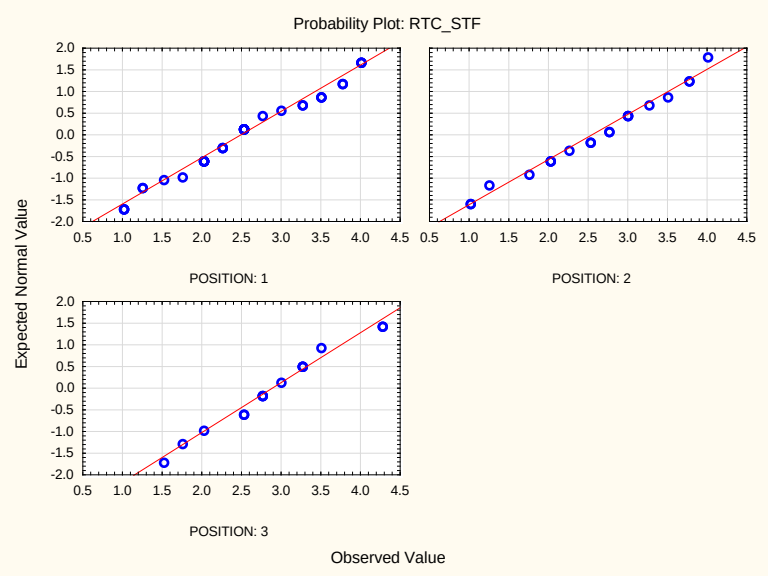
Variable	Levene Test of Homogeneity of Variances (Bullock 6) Marked effects are significant at p < .05000							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	32.45719	2	16.22860	958.8844	64	14.98257	1.083165	0.344646
TM_T	32.45719	2	16.22860	958.8844	64	14.98257	1.083165	0.344646
RTC_RS	0.01146	2	0.00573	10.3780	69	0.15041	0.038095	0.962641
RTC_ER	1.77091	2	0.88545	13.6311	69	0.19755	4.482114	0.014788
RTC_STF	0.11608	2	0.05804	18.8195	69	0.27275	0.212806	0.808842
RTC_CR	0.79937	2	0.39968	16.2592	69	0.23564	1.696158	0.190943
RTC	0.16470	2	0.08235	7.9260	69	0.11487	0.716915	0.491857

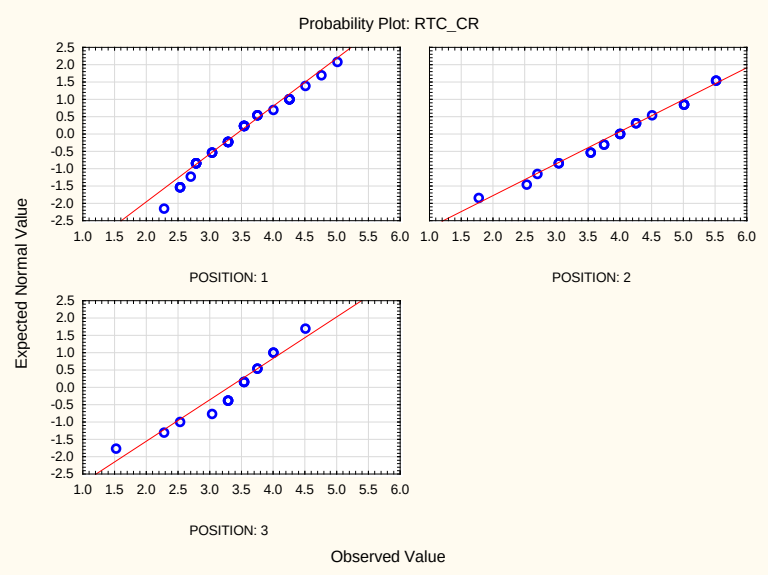

Probability Plot: MM_T
Expected Normal Value
POSITION: 1
POSITION: 2
POSITION: 3
Observed Value

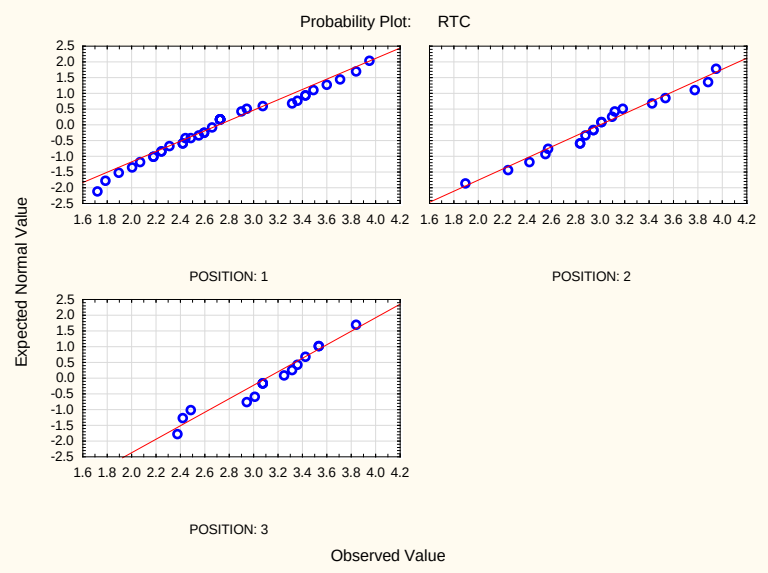

Probability Plot: TM_T
Expected Normal Value
POSITION: 1
POSITION: 2
POSITION: 3
Observed Value


Probability Plot: RTC_RS
Expected Normal Value
POSITION: 1
POSITION: 2
POSITION: 3
Observed Value

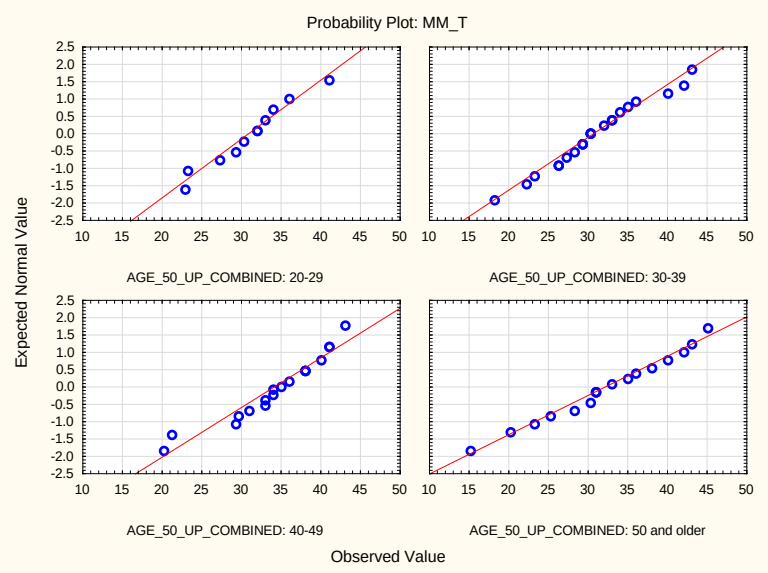

Probability Plot: RTC_ER
Expected Normal Value
POSITION: 1
POSITION: 2
POSITION: 3
Observed Value

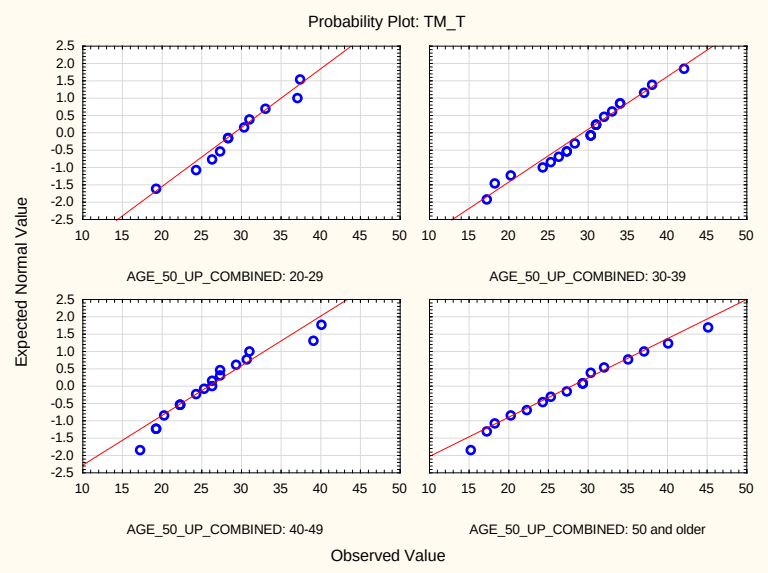

Probability Plot: RTC_STF
Expected Normal Value
POSITION: 1
POSITION: 2
POSITION: 3
Observed Value

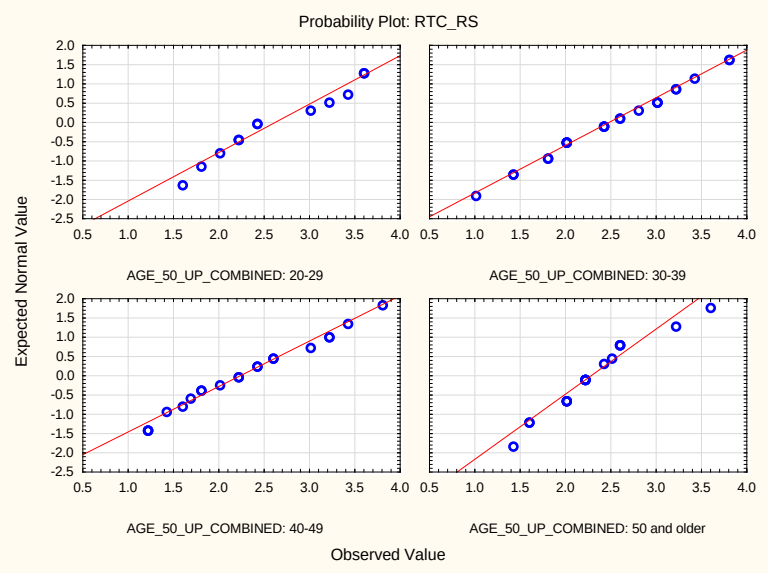

Probability Plot: RTC_CR
Expected Normal Value
POSITION: 1
POSITION: 2
POSITION: 3
Observed Value

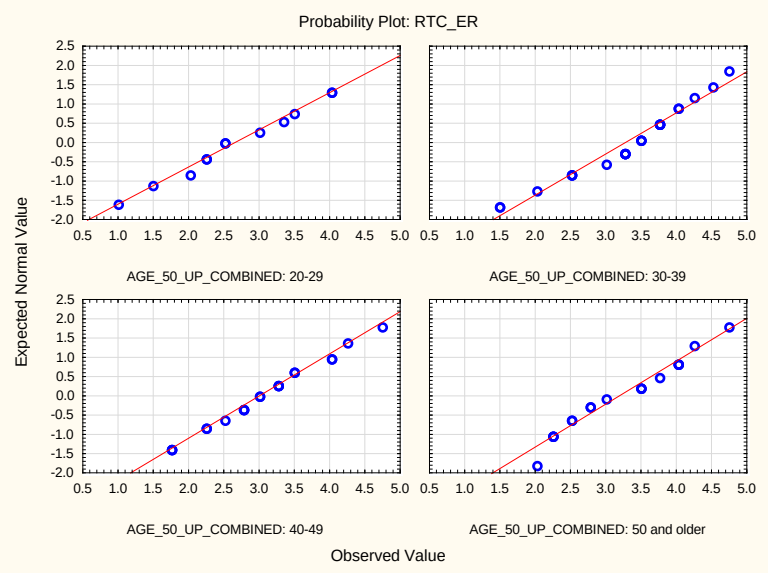


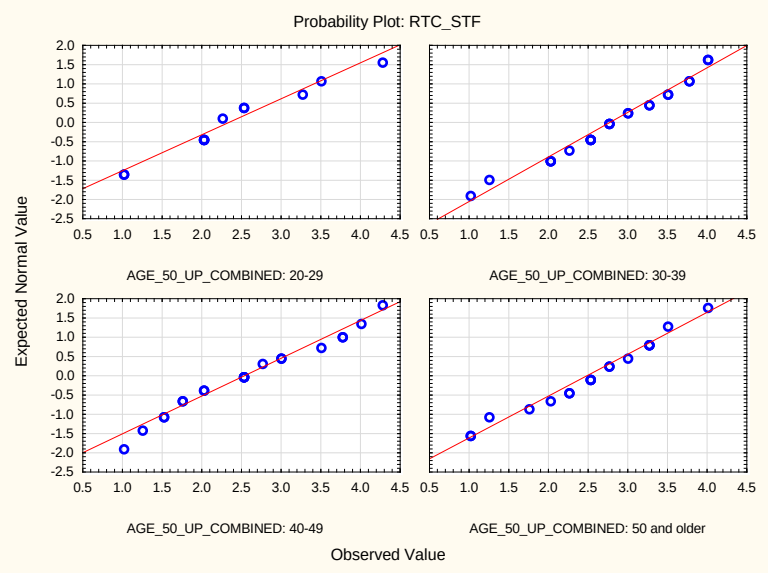
Variable	Levene Test of Homogeneity of Variances (Bullock 6) Marked effects are significant at p < .05000							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
MM_T	48.16471	3	16.05490	1090.096	64	17.03276	0.942590	0.425400
TM_T	48.16471	3	16.05490	1090.096	64	17.03276	0.942590	0.425400
RTC_RS	0.76788	3	0.25596	10.393	69	0.15063	1.699264	0.175235
RTC_ER	0.11153	3	0.03718	16.228	69	0.23519	0.158068	0.924135
RTC_STF	0.22537	3	0.07512	19.228	69	0.27867	0.269580	0.847116
RTC_CR	0.86012	3	0.28671	15.422	69	0.22350	1.282792	0.287190
RTC	0.37427	3	0.12476	6.514	69	0.09441	1.321467	0.274454

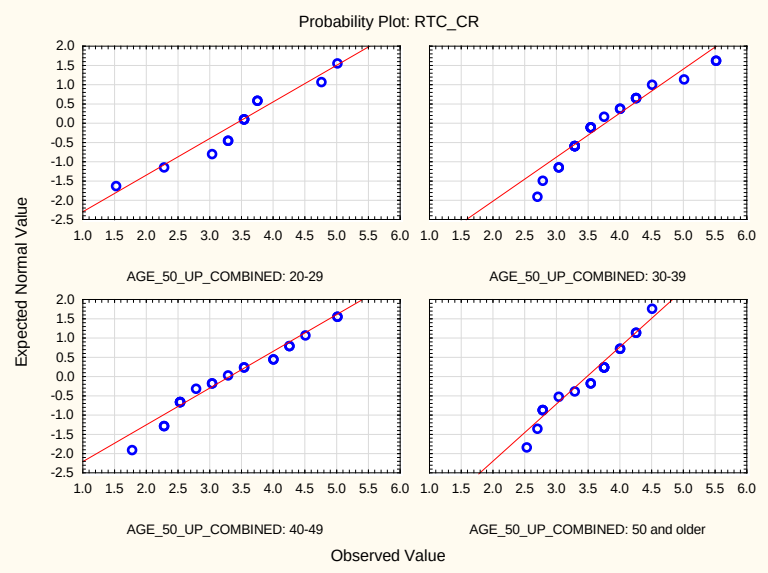


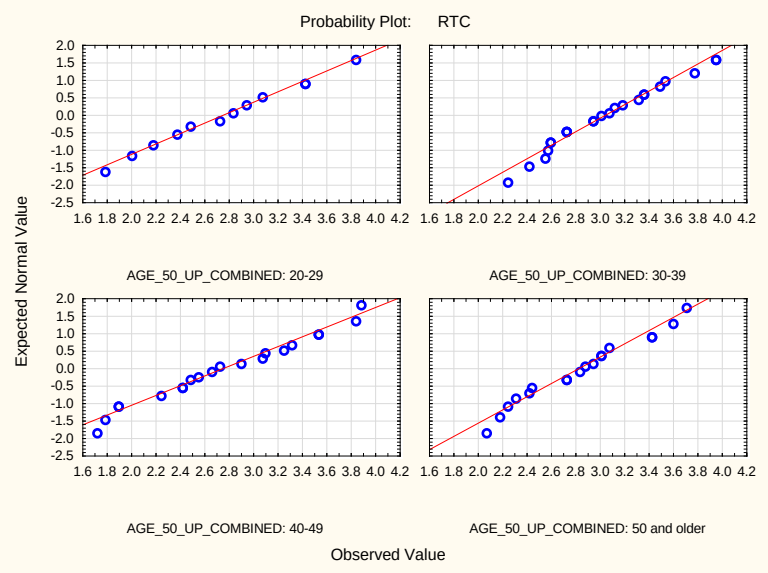

Probability Plot: TM_T
Expected Normal Value
AGE_50_UP_COMBINED: 20-29
AGE_50_UP_COMBINED: 30-39
AGE_50_UP_COMBINED: 40-49
AGE_50_UP_COMBINED: 50 and older
Observed Value


Probability Plot: RTC_RS
Expected Normal Value
AGE_50_UP_COMBINED: 20-29
AGE_50_UP_COMBINED: 30-39
AGE_50_UP_COMBINED: 40-49
AGE_50_UP_COMBINED: 50 and older
Observed Value


Probability Plot: RTC_ER
Expected Normal Value
AGE_50_UP_COMBINED: 20-29
AGE_50_UP_COMBINED: 30-39
AGE_50_UP_COMBINED: 40-49
AGE_50_UP_COMBINED: 50 and older
Observed Value


Probability Plot: RTC_STF
Expected Normal Value
AGE_50_UP_COMBINED: 20-29
AGE_50_UP_COMBINED: 30-39
AGE_50_UP_COMBINED: 40-49
AGE_50_UP_COMBINED: 50 and older
Observed Value


Probability Plot: RTC_CR
Expected Normal Value
AGE_50_UP_COMBINED: 20-29
AGE_50_UP_COMBINED: 30-39
AGE_50_UP_COMBINED: 40-49
AGE_50_UP_COMBINED: 50 and older
Observed Value


Probability Plot: RTC
Expected Normal Value
AGE_50_UP_COMBINED: 20-29
AGE_50_UP_COMBINED: 30-39
AGE_50_UP_COMBINED: 40-49
AGE_50_UP_COMBINED: 50 and older
Observed Value

APPENDIX I CORRELATION FACTORS

Correlations

			MM_T	TM_T	RTC_RS	RTC_ER	RTC_STF	RTC_CR	RTC
Spearman's rho	MM_T	Correlation Coefficient	1.000	-1.000**	-.460**	-.282*	-.404**	-.279*	-.474**
		Sig. (2-tailed)			.000	.020	.001	.021	.000
		N	68	68	68	68	68	68	68
	TM_T	Correlation Coefficient	-1.000**	1.000	.460**	.282*	.404**	.279*	.474**
		Sig. (2-tailed)			.000	.020	.001	.021	.000
		N	68	68	68	68	68	68	68
	RTC_RS	Correlation Coefficient	-.460**	.460**	1.000	.412**	.513**	.239*	.751**
		Sig. (2-tailed)	.000	.000		.000	.000	.041	.000
		N	68	68	73	73	73	73	73
	RTC_ER	Correlation Coefficient	-.282*	.282*	.412**	1.000	.513**	.034	.671**
		Sig. (2-tailed)	.020	.020	.000		.000	.772	.000
		N	68	68	73	73	73	73	73
	RTC_STF	Correlation Coefficient	-.404**	.404**	.513**	.513**	1.000	.290*	.837**
		Sig. (2-tailed)	.001	.001	.000	.000		.013	.000
		N	68	68	73	73	73	73	73
	RTC_CR	Correlation Coefficient	-.279*	.279*	.239*	.034	.290*	1.000	.530**
		Sig. (2-tailed)	.021	.021	.041	.772	.013		.000
		N	68	68	73	73	73	73	73
	RTC	Correlation Coefficient	-.474**	.474**	.751**	.671**	.837**	.530**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
		N	68	68	73	73	73	73	73

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX J

Frequencies

Statistics

MO_Cat

N	Valid	68
	Missing	5

MO_Cat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MM=[0,20];TM=[40,60]	4	5.5	5.9	5.9
	MM=(20,30];TM=[30,40)	24	32.9	35.3	41.2
	MM=(30,50];TM=[10,30)	40	54.8	58.8	100.0
	Total	68	93.2	100.0	
Missing	System	5	6.8		
Total		73	100.0		

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MM_T	68	15.00	45.00	31.98	6.71
TM_T	68	15.00	45.00	28.02	6.71
RTC_RS	73	1.0000	3.8000	2.39	0.71
RTC_ER	73	1.0000	4.7500	3.08	0.87
RTC_STF	73	1.00	4.25	2.57	0.88
RTC_CR	73	1.5000	5.5000	3.51	0.84
RTC	73	1.7059	3.9412	2.86	0.57
MO_Cat	68	1	3	2.53	.610
Valid N (listwise)	68				

APPENDIX K

Reliability :MM

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	83.6
	Excluded[a]	12	16.4
	Total	73	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.685	.679	12

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.150	-.180	.413	.593	-2.291	.021	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1A	29.54	41.519	.193	.181	.689
Q2A	29.84	39.406	.464	.370	.645
Q3A	29.52	42.187	.290	.157	.670
Q4B	30.79	40.970	.291	.212	.670
Q5A	28.33	45.357	.071	.377	.695
Q6B	29.82	41.517	.280	.323	.672
Q7B	30.23	38.146	.472	.320	.640
Q8B	29.85	39.195	.353	.282	.660
Q9B	29.39	41.209	.283	.271	.671
Q10A	28.97	36.799	.547	.376	.626
Q11B	29.98	43.450	.142	.270	.692
Q12A	29.70	38.445	.455	.347	.643

APPENDIX L

Reliability :TM

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	63	86.3
	Excluded[a]	10	13.7
	Total	73	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.693	.691	12

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.157	-.195	.405	.600	-2.081	.019	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1B	25.51	41.512	.214	.151	.695
Q2B	25.32	39.994	.448	.406	.657
Q3B	25.63	43.010	.254	.116	.684
Q4A	24.30	41.601	.275	.276	.682
Q5B	26.87	45.080	.176	.358	.692
Q6A	25.24	41.604	.285	.386	.680
Q7A	24.87	38.758	.462	.268	.653
Q8A	25.29	40.143	.320	.208	.676
Q9A	25.71	41.175	.317	.267	.676
Q10B	26.14	37.124	.554	.367	.636
Q11A	25.08	43.300	.169	.305	.698
Q12B	25.41	38.762	.468	.325	.652

ANNEXURE M

Reliability :Routine seeking

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	71	97.3
	Excluded[a]	2	2.7
	Total	73	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.640	.655	5

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.276	.018	.506	.488	27.904	.022	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
QBN1	9.77	9.606	.378	.233	.596
QBN2	9.28	7.291	.519	.314	.515
QBN3	9.99	8.814	.592	.420	.512
QBN4_r	8.62	8.610	.309	.149	.640
QBN5	10.28	10.177	.245	.171	.650

Reliability :Emotional Reaction

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	72	98.6
	Excluded[a]	1	1.4
	Total	73	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.703	.704	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.373	.091	.639	.548	7.024	.033	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
QBN6	9.35	7.272	.618	.438	.562
QBN7	9.19	6.553	.669	.501	.517
QBN8	8.93	7.756	.421	.271	.683
QBN9	9.49	8.986	.283	.126	.755

Reliability :Short-term focus

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	72	98.6
	Excluded[a]	1	1.4
	Total	73	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.819	.819	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.531	.408	.628	.221	1.541	.005	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
QBN10	7.61	7.875	.560	.325	.809
QBN11	7.74	7.324	.691	.483	.750
QBN12	7.67	6.986	.704	.501	.742
QBN13	7.74	7.634	.613	.396	.786

Reliability :Cognitive rigidity

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	69	94.5
	Excluded[a]	4	5.5
	Total	73	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.565	.568	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	.247	.000	.487	.487	-1607.287	.039	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
QBN14_r	10.06	8.673	.091	.044	.685
QBN15	11.26	6.284	.489	.244	.371
QBN16	10.74	6.078	.440	.300	.409
QBN17	10.07	7.186	.425	.276	.440

PPENDIX N

T-Test

Group Statistics

APPOINT		N	Mean	Std. Deviation	Std. Error Mean	Effect size
MM_T	1	37	33.86	6.84	1.12450	0.60
	2	31	29.74	5.91	1.06230	
TM_T	1	37	26.14	6.84	1.12450	0.60
	2	31	30.26	5.91	1.06230	
RTC_RS	1	37	2.21	0.70	.1154560	0.55
	2	35	2.60	0.67	.1133512	
RTC_ER	1	37	2.86	0.84	.1385456	0.55
	2	35	3.33	0.86	.1455649	
RTC_STF	1	37	2.45	0.91	.14908	0.25
	2	35	2.68	0.86	.14479	
RTC_CR	1	37	3.36	0.70	.1148133	0.29
	2	35	3.63	0.93	.1569730	
RTC	1	37	2.69	0.60	.0987960	0.56
	2	35	3.03	0.49	.0831265	

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MM_T	Equal variances assumed	.954	.332	2.633	66	.01	4.12586	1.56706	.99713	7.25459
	Equal variances not assumed			2.667	65.923	.01	4.12586	1.54693	1.03725	7.21447
TM_T	Equal variances assumed	.954	.332	-2.633	66	.01	-4.12586	1.56706	-7.25459	-.99713
	Equal variances not assumed			-2.667	65.923	.01	-4.12586	1.54693	-7.21447	-1.03725
RTC_RS	Equal variances assumed	.001	.975	-2.385	70	.02	-.3863320	.1620085	-.7094478	-.0632163
	Equal variances not assumed			-2.388	69.993	.02	-.3863320	.1617980	-.7090285	-.0636356
RTC_ER	Equal variances assumed	.109	.742	-2.354	70	.02	-.4728443	.2008353	-.8733976	-.0722909
	Equal variances not assumed			-2.353	69.577	.02	-.4728443	.2009577	-.8736847	-.0720038
RTC_STF	Equal variances assumed	.082	.776	-1.085	70	.28	-.22587	.20815	-.64102	.18928
	Equal variances not assumed			-1.087	70.000	.28	-.22587	.20782	-.64035	.18862
RTC_CR	Equal variances assumed	1.521	.222	-1.403	70	.17	-.2707207	.1929655	-.6555784	.1141369
	Equal variances not assumed			-1.392	63.063	.17	-.2707207	.1944804	-.6593511	.1179097
RTC	Equal variances assumed	1.256	.266	-2.611	70	.01	-.3390193	.1298366	-.5979702	-.0800684

	Equal variances not assumed			-2.626	68.607	.01	-.3390193	.1291149	-.5966229	-.0814157

NPar Tests

Mann-Whitney Test

Ranks

APPOINT		N	Mean Rank	Sum of Ranks
MM_T	1	37	40.23	1488.50
	2	31	27.66	857.50
	Total	68		
TM_T	1	37	28.77	1064.50
	2	31	41.34	1281.50
	Total	68		
RTC_RS	1	37	30.64	1133.50
	2	35	42.70	1494.50
	Total	72		
RTC_ER	1	37	31.12	1151.50
	2	35	42.19	1476.50
	Total	72		
RTC_STF	1	37	33.72	1247.50
	2	35	39.44	1380.50
	Total	72		
RTC_CR	1	37	32.74	1211.50
	2	35	40.47	1416.50
	Total	72		
RTC	1	37	30.34	1122.50
	2	35	43.01	1505.50

Total	72		

Test Statistics[a]

	MM_T	TM_T	RTC_RS	RTC_ER	RTC_STF	RTC_CR	RTC
Mann-Whitney U	361.500	361.500	430.500	448.500	544.500	508.500	419.500
Wilcoxon W	857.500	1064.500	1133.500	1151.500	1247.500	1211.500	1122.500
Z	-2.614	-2.614	-2.455	-2.251	-1.167	-1.573	-2.571
Asymp. Sig. (2-tailed)	.01	.01	.01	.02	.24	.12	.01

a. Grouping Variable: APPOINT

Effect size	0.32	0.32	0.29	0.27	0.14	0.19	0.30

T-Test

Group Statistics

GENDER		N	Mean	Std. Deviation	Std. Error Mean	Effect size
MM_T	1	47	32.4971	6.79595	.99129	0.24
	2	21	30.8355	6.54354	1.42792	
TM_T	1	47	27.5029	6.79595	.99129	0.24
	2	21	29.1645	6.54354	1.42792	
RTC_RS	1	51	2.381699	.7364876	.1031289	0.03
	2	22	2.404545	.6593484	.1405735	
RTC_ER	1	51	3.001634	.8052760	.1127612	0.27
	2	22	3.272727	1.0086208	.2150387	
RTC_STF	1	51	2.5784	.89231	.12495	0.04

	2	22	2.5455	.86821	.18510	
RTC_CR	1	51	3.410131	.7854304	.1099823	0.38
	2	22	3.757576	.9189758	.1959263	
RTC	1	51	2.815594	.5774202	.0808550	0.25
	2	22	2.958010	.5502054	.1173042	

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
MM_T	Equal variances assumed	.311	.579	.942	66	.350	1.66160	1.76399	-1.86031	5.18351
	Equal variances not assumed			.956	39.894	.345	1.66160	1.73828	-1.85188	5.17508
TM_T	Equal variances assumed	.311	.579	-.942	66	.350	-1.66160	1.76399	-5.18351	1.86031
	Equal variances not assumed			-.956	39.894	.345	-1.66160	1.73828	-5.17508	1.85188
RTC_RS	Equal variances assumed	.307	.581	-.125	71	.901	-.0228461	.1822600	-.3862622	.3405699
	Equal variances not assumed			-.131	44.299	.896	-.0228461	.1743459	-.3741503	.3284581
RTC_ER	Equal variances assumed	2.104	.151	-1.221	71	.226	-.2710933	.2220112	-.7137711	.1715845
	Equal variances not assumed			-1.116	33.086	.272	-.2710933	.2428101	-.7650454	.2228588
RTC_STF	Equal variances assumed	.002	.968	.146	71	.884	.03298	.22580	-.41726	.48322

	Equal variances not assumed			.148	40.929	.883	.03298	.22333	-.41807	.48402
RTC_CR	Equal variances assumed	.352	.555	-1.647	71	.104	-.3474450	.2109911	-.7681493	.0732592
	Equal variances not assumed			-1.546	34.866	.131	-.3474450	.2246847	-.8036420	.1087520
RTC	Equal variances assumed	.502	.481	-.980	71	.330	-.1424161	.1452658	-.4320679	.1472358
	Equal variances not assumed			-1.000	41.738	.323	-.1424161	.1424704	-.4299865	.1451543

NPar Tests

Mann-Whitney Test

Ranks

GENDER		N	Mean Rank	Sum of Ranks
MM_T	1	47	35.71	1678.50
	2	21	31.79	667.50
	Total	68		
TM_T	1	47	33.29	1564.50
	2	21	37.21	781.50
	Total	68		
RTC_RS	1	51	36.58	1865.50
	2	22	37.98	835.50
	Total	73		
RTC_ER	1	51	34.89	1779.50
	2	22	41.89	921.50
	Total	73		
RTC_STF	1	51	37.11	1892.50

	2	22	36.75	808.50
	Total	73		
RTC_CR	1	51	34.40	1754.50
	2	22	43.02	946.50
	Total	73		
RTC	1	51	35.54	1812.50
	2	22	40.39	888.50
	Total	73		

Test Statistics[a]

	MM_T	TMT_T	RTC_RS	RTC_ER	RTC_STF	RTC_CR	RTC
Mann-Whitney U	436.500	436.500	539.500	453.500	555.500	428.500	486.500
Wilcoxon W	667.500	1564.500	1865.500	1779.500	808.500	1754.500	1812.500
Z	-.758	-.758	-.259	-1.298	-.066	-1.600	-.896
Asymp. Sig. (2-tailed)	.449	.449	.795	.194	.947	.110	.370

a. Grouping Variable: GENDER

Effect size

0.09	0.09	.03	0.15	.01	0.19	.10