ASSESSMENT OF THE TIME ORIENTATION OF CLINICAL RESEARCH ASSOCIATES IN THE PHARMACEUTICAL INDUSTRY OF SOUTH AFRICA.

A RESEARCH REPORT

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BY

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DECLARATION

"I declare that **Assessment of the time orientation of Clinical Research Associates in the pharmaceutical industry of South Africa** is my original work and has not been submitted for degree purposes previously. All sources that I have used or quoted has been indicated and acknowledged as complete references."

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KORETHA RAS *DATE*

ACKNOWLEDGEMENTS

ABSTRACT

This research study was the first to investigate the nature of time-use behaviour of the South African Clinical Research Associates (CRA's) and Clinical Trial Managers (CTM's). The study determined the relative polychronicity of project members in clinical trials in South Africa and identified possible non-alignment in the approaches and expectations between managers of clinical research projects and that of their project staff members. The study assumed that the clinical trial project environment is monochronic by nature. Information about a possible mismatch in expected temporal orientation of project staff and real temporal orientation of project staff would constitute grounds for adaptation of project management execution guidelines and staff selection processes for CRA's and Managers of clinical trials.

Quantitative data were collected through the Inventory of Polychronic Values measuring instrument from a sample of the total registered membership base of the South African Clinical Research Association by means of a web based questionnaire. The study analysed the relationships between the following three constructs of relevance:
1. CRA's own personal preferences for time-use, and
2. CRA's perceptions of what time-use behaviour their direct managers expect from them, and
3. Managers' expectations for the time-use behaviour of CRA's.

CRA's were found to be relatively monochronic in their work behaviour towards time-use and Managers to be more polychronic than CRA's. Within each group a range of time-use opinions and preferences were found. Within the constraints of sample size, Cultural Heritage and Age were the only demographic variables found to exert significant influence on the dependent variables in this study. A good alignment was found between the CRA's perceptions of the time-use behaviours expected from them and the Managers' expectations for time-use behaviour.

The results of this study relate to complementary role differentiation between monochronic and polychronic people in project execution and management.

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Chapter 1: Introduction and Contextualization

1.1   Introduction

The notion that "Time is Money" is often cited as part of the organisational culture in the world of business and in the offices of commercial companies (Kaufman-Scarborough, 2003). In commercial operations such as clinical trial management, where work is organised on the basis of a project structure, adherence to time and monetary budget allocations are two of the key performance parameters by which the overall project performance, as well as individual project member performances, are measured and evaluated. However, in spite of the well-defined structures, tools and procedures developed and available to manage time and budget in projects, people's perceptions and understanding of what time is, how it should be prioritised, and how it should be spent differs widely (Norris, Teng & Ford, 2005). These differences in people's perception of time and temporal processes are attributed largely to their underlying value systems. Temporal orientation of people, seen in a cultural context, has been found to be best defined as a continuum of perceptions ranging from monochronic to polychronic. People perceptions on this temporal continuum were shown to correlate with the cultural context continuum that ranges from low context cultures to high context cultures. People from the monochronic, low context extreme of these continuums are characterised by regularity of behaviour according to clock time, execution of work units according to a strict sequence and one at a time, and a tendency to be very structured in their approach. On the other extreme, polychronic, high context people's behaviour is prioritised and influenced by their relationships, work is executed on the basis of doing different units at the same time and they prefer flexibility above rigid structure.

Current project management guidelines and staff selection rules for clinical trial management in the pharmaceutical industry do not take cognisance of these different time orientations of project staff members.

1.2   Purpose of the research

Since the performance of projects and project staff members are measured, amongst others, by adherence to pre-determined time schedules, experimental design pro-forma's, sample selection rules and patient compliance rules, it is expected that there

should be conflict as a result of having polychronic people in the project team. The primary objective of this research is to establish what the mix of monochronic and polychronic project staff members in clinical trials is in South Africa.

Clinical trials are managed by a team of Clinical Research Associates (CRA's) that reports to a Lead CRA, or to a Clinical Trial Manager (CTM). This study is therefore focused on determining the extent to which CRA's are polychronic. Such information will be essential in developing guidelines for project management and people selection in clinical trial projects.

1.3   Research Objectives

Based on the relationships between people's cultural environment and their orientation to time, it was found and argued that people's cultural traits influence the way they perceive time and their preferences with respect to time use (Cunha and Cunha, 2004; Cotte, Ratneshwar & Mick, 2004; Kaufmann-Scarborough and Lindquist, 1999; Bluedorn, Kaufman & Lane, 1992). In today's multinational organisations people from different cultural groupings work together in the same organisation and even in the same teams (Booysen, 2001a; Trompenaars, 1993). Therefore, a number of cultural orientations co-exist in the same subsidiary, and even in the same project team. It has been shown by the research reports referenced above, that some of these cultural dimensions value the concept of time and time use differently to the underlying paradigm by which the organisation or team operates. The underlying assumption is that this diversity is creating a non-alignment between the staff and the organisation's own preferences and traits.

Morden (1999) suggests that the mixing, or collaboration, between people of monochronic orientations together with people of polychronic orientations, may give rise to constant culture clash and disagreement. Since projects are the primary base for organising workflow in the corporate structures of executing work, there is a real concern about the degree of efficiency losses due to staff members being more polychronic or monochronic than the organisation itself, or their direct managers (Cunha *et al.*, 2004; Onken, 1998).

The arguments made above represent possible concerns, due to multiple time orientations of people, in executing clinical trial projects in the multicultural environment

of South Africa. This research report is aimed at investigating the time orientation perceptions of CRA's and CTM's in order to identify possible gaps between the preferences and perceptions of individual CRA's and the preferences of their supervisors, the CTM's (or Lead CRA's). The purpose of the study is to identify possible non-alignment in the approaches and expectations of managers of clinical research projects (CTM's or Lead CRA's) and that of their project staff members (CRA's). In general, such areas of non-alignment represent areas of organisational and business efficiency improvement (Slocombe and Bluedorn, 1999). In the case of clinical trials in South Africa there is a need for training to make up for a shortage of qualified and experienced staff. Such training is argued to also include awareness and skills testing for managing the broad diversity of the post-1994 South Africa.

1.4 Research Problem Statement

1.4.1 Main Research Problem

The main problem is to identify the extent to which CRA's, being project staff members on clinical trials, show polychronic behaviour. The project environment is monochronic by nature. Information about a possible mismatch in expected temporal orientation of project staff and real temporal orientation of project staff would constitute grounds for adaptation of project management execution guidelines and staff selection processes for CRA's.

1.4.2 Sub Problems

a. What do South African CRA's perceive their respective organisations (managers) to expect from them in terms of time orientation,

b. How do South African managers of CRA's, namely CTM's and Lead CRA's, expect CRA's to behave in terms of time orientation,

c. What are the implications of differences of time perceptions of CRA's on the management of projects in a clinical research environment?

1.5 Definition of key terms

1.5.1 National Culture:

Hofstede (1984), defines national culture as the collective mental programming of the people of any nationality. Hofstede (1984) suggests that people share a collective national character which represents their cultural mental programming. This mental programming shapes the values, attitudes, competences, and perceptions of priority of that nationality. It is useful to note that he emphasizes that mental programs are intangible and described in terms of constructs. Constructs do not "exist" in the absolute sense: we define them into existence.

1.5.2 Organisational Culture:

Trompenaars (1993) defines corporate or organisational culture as the way in which attitudes are expressed within a specific organisation. Organisational culture is shaped by technologies, markets and by the cultural preferences of leaders and employees Trompenaars (1993). Some international companies have European, Asian, American, African or Middle Eastern subsidiaries which would be unrecognizable as the same company save for their logo and reporting procedures. Often these are fundamentally different in the logic of their structure and the meanings they bring to shared activity.

1.5.3 Polychronicity:

Bluedorn, Kalliath, Strube & Martin (1999) defined polychronicity as a cultural construct in terms of the extent to which people in a specific culture prefer to be engaged in two or more tasks or events simultaneously. This definition includes three facets of cultural polychronicity:
   a. Beliefs (the extent to which people in a culture believe their preference is the right way to do things);
   b. Attitudes (the extent to which people in a culture prefer to be engaged in two or more events simultaneously);
   c. Behaviours (the extent to which the scheduling of two or more events at the same time is actually practiced).
This construct also applies to the level of an individual. At his level polychronicity focuses on the number of related and unrelated tasks, activities, and stimuli an individual attends to, participates in, and is involved with literally at one time or within relatively brief spans of time (Persing, 1999).

1.5.4 Monochronicity:

The construct of monochronicity is defined, in one way, as the opposite extreme of polychronicity on a linear continuum, but also, in another way, as complementary to polychronicity in the sense that any person has the potential to have characteristics of both. At the individual level people with a monochronic orientation are task-oriented, emphasize promptness and a concern for other's privacy, stick to their plans, seldom borrow or lend private property, and are accustomed to short-term relationships with other people (Bluedorn *et al.*, 1992). It is measured by the clock and regarded as a very efficient, focused way to manage work and life.

1.5.5 Clinical Research Environment:

This concept refers to the environment within which pharmaceutical clinical trial projects are conducted. Typically these studies are executed within a Clinical Research Organisation under contract of a pharmaceutical manufacturer, or in some cases it is managed by the manufacturing company itself. Clinical trials are executed under the supervision of a CTM or Lead CRA who oversees a number of CRA's. The CRA's are responsible to obtain appropriate sites with practicing medical doctors and specialists where specific medical conditions are being treated that require a specific method, medical device or drug, an instance of which would be on trial at the specific site. CRA's are expected to manage the trial according to a pre-determined experimental design and within pre-determined Standard Operating Procedures and a project management framework.

1.5.6 Project Management Style and Approach:

Although most project management methodologies are based or derived from the PMBOK® framework (2004) they differ in nuances of form and format in response to differences in the various environments in which projects are being executed. According to the PMBOK® framework a project is defined as a temporary endeavour undertaken to create a unique product, service or result. It has a definite beginning and a definite end. The end is reached when the project's objectives have been met, or the need for the project no longer exists and the project is terminated. Project management is defined as the application of knowledge, skills, tools and techniques to project activities to meet

project requirements. Project management is achieved through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing a project. Managing a project includes identifying requirements, establishing clear and achievable objectives, balancing the competing demands for quality, scope, time and cost, and adapting the specifications, plans and approach to the different concerns and expectations of the various stakeholders. Project managers often talk about a triple constraint, meaning project scope, time and cost, in managing competing project requirements. Project quality is affected by balancing these three factors. High quality projects deliver the required product, service or result within scope, on time and within budget.

1.6   Assumptions of the study

a. An important assumption from a data collection perspective is that respondents will be willing to complete the survey questionnaire based on their honest opinion.

b. The sample of respondents, consisting of all the CRA's and CTM's that are registered at the South African Clinical Research Association (SACRA), cover a wide enough representation to be regarded as representative of all the CRA's and CTM's in South Africa.

c. It is therefore assumed that the sample of CRA's will be random in terms of individual characteristics within the sample and that the sample will be representative of CRA's in South Africa.

1.7   Methodology and Research Design

This research was quantitative in nature. Quantitative data were collected by means of a questionnaire. Communication to people in the sample group was done through direct presentation to create awareness of the research project, and through e-mail to encourage the sample group to respond to the questionnaire. The questionnaire was administered and accessed through a web based application.

This research study aims to investigate the following propositions:
P1:   That CRA's have different personal preferences for time orientation

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P2:	The CRA's have different perceptions about their manager's time orientation expectations
P3:	The managers (CTM's and Lead CRA's) have different expectations for CRA's time orientation behaviour
P4:	The CRA's personal preferences for their own time orientation is significantly different from the CRA's perceptions about their manager's time orientation expectations
P5:	The CRA's personal preferences for their own time orientation is significantly different from the managers' (CTM's and Lead CRA's) own expectations about time orientation behaviour
P6:	The CRA's perceptions about their manager's time orientation expectation is significantly different from the manager's (CTM's) own expectations for time orientation behaviour

The first three of these propositions (P1, P2 and P3) will be investigated by analyzing and comparing descriptive statistics of group sub-categories and cross tabulation. Propositions P4, P5 and P6 will be investigated by using a combination of analysis of variance between groups and hypothesis testing.

1.8   Limitations and Delimitations of the study

1.8.1   Limitations:

a. This study will deliver insights about the temporal orientation of CRA's, as well as an assessment about the impact of the polychronicity of CRA's on management styles, approaches and work performance. It will assess the perceptions of CRA's of the temporal expectations of their managers (CTM's and Lead CRA's), as well as the Gap between the Perceptions of CRA's about their managers' expectations, and also the expectation of the managers themselves. It will not provide information or insight about the causality between polychronicity of CRA's and their managers and any potential association with work performance.

b. The sample of targeted respondents covers only the CRA's and CTM's that are registered at the SACRA.

c. Availability of respondents to participate in the study during the research period may be limited.

d. Respondents may provide ideal rather than honest responses to the questions posed.

e. The fact that the questionnaire will be web based may deter some respondents to participate.

1.8.2 Delimitations:

In terms of sample boundaries it needs to be noted that the sample of respondents that participated in this study only represents the CRA's, Lead CRA's and CTM's that are registered with SACRA. This excludes those professionals who are not registered with SACRA and practicing in the clinical research industry. The latter group, however; represents a comparatively small percentage (less than 10%) of the practicing CRA's, Lead CRA's and CTM's practicing in South Africa.

Since this is the first time that South African professionals in this industry are being investigated from a time orientation perspective, this study is explorative in nature. It does not attempt to find cause-effect relationships but rather to characterise a hitherto unexplored domain. The theoretical model underlying this study is designed by the researcher to focus this explorative mindset onto a limited number of variables namely:

a. the CRA's personal perceptions of their own time orientations, and
b. the CRA's perceptions of what time orientation behaviour their direct managers expect from them, and
c. the CTM's expectations for the time orientation behaviour of CRA's .

This study does not offer insight into other characteristics that could be associated with polychronicity, for example high/low context cultures, pace of life, past, present en future tense, event time, etc.

1.9 Importance of the Study

1.9.1 The Research Gap

This study attempts to apply existing knowledge about the time orientations of people, from a cultural perspective, together with existing knowledge about project performance management to investigate the nature of project management in a clinical research environment, as a function of the relative polychronicity of project team members. The important aspect that would represent new knowledge or insight would be the information and knowledge generated through the survey about the nature and the behaviour of the South African CRA's and CTM's with respect to time orientation.

1.9.2 Alignment of Project Management and Time Orientation of Project Staff

Project management guidelines and procedures (Standard Operating Procedures) are by nature very monochronic and it is expected that very polychronic project staff members may experience difficulties in coping with the everyday expectations for individual performance. A verified time orientation profile of the CRA's and CTM's may be valuable in determining new project operating guidelines to accommodate these differences among people.

1.9.3 Awareness Creation

There is definitive need for standard operating procedures for clinical trial organisation and project management to also accommodate polychronic people, especially in Africa where there seems to be a tendency towards polychronic behaviour (Morden, 1999). This project will create the awareness of the phenomenon amongst members of the SACRA.

1.10 Outline of Research Report

Chapter One introduces the topic of this study and discusses the purpose of the research, the research problem and sub-problems, the assumptions for the study,

limitations and delimitations of the study and the importance of the study. It also defines the key terms used in this study.

Chapter Two discusses the fundamentals of people's time orientation and its implications for the way people behave. It defines the theoretical framework for this study from a cultural perspective. It integrates previous research findings published in literature and provides a discussion about the research questionnaires used in this field. It portrays monochronic and polychronic behaviour as a continuum and provides a link to time management, job fit, and job satisfaction in the workplace. It suggests that project management principles are creating a monochronic work environment.

In Chapter Three an analysis of project management as a management discipline, and its relationship to organisational culture, organisational structure and project performance evaluation is offered. It concludes with an awareness that polychronicity, as a cultural phenomenon, can potentially influence project performance.

A theoretical model for this study is proposed in Chapter Four, based on previously published research results, to substantiate the hypotheses and the ensuing analysis made in this study.

The research methods are discussed in Chapter Five with reference to the sample and survey instruments. This includes a discussion of the sampling framework as well as the participants in the research. The contents of the questionnaire to be used are discussed. The research problem and sub-problems are restated in the context of the literature, theoretical model and the practical occurrence of the phenomenon. The data collection as well as the proposed data analysis procedures are discussed.

Chapter Six discusses the results from the research. The results from all the sample groups are collated and presented.

In Chapter Seven the research results are discussed in detail and compared with theory and with results from studies in other industries. The survey results are used to qualify the six propositions of this study and discussed in terms of the theoretical model that was constructed in this study from existing published theory. Recommendations are made based on literature review and own experimental findings, about the polychronicity of CRA's and what should be done to better align the implementation framework of

project management to polychronic project staff members. The validity of the proposed model is also described in terms of the empirical data.

The following chapter, Chapter Two, discusses the differences between polychronic and monochronic people and the traits and qualities that are associated with these concepts. It also discusses the time management in organisations and the associated workplace implications.

Chapter 2: Time Perception as a Cultural Construct

2.1   Cultural perception of time and polychronicity

Time as we know it is not as one-dimensional and universal as some of us may think or want it to be. Hall (1960) illustrated how time in the world of international business is experienced as an integrated element of cultural expression together with space, material, possessions, friendship patterns and agreements. He defined the concepts of monochronicity and polychronicity first in order to distinguish between two opposites in terms of cultural perception of time.

A monochronic perception is measured by the clock and is usually decided in advance. This method of time measurement values promptness, speed, brevity and punctuality. It is a very efficient, focused way to manage work and life. The polychronic perception of time incorporates many complex factors that are typically made intuitively, at the moment, as events play out. Polychronic time values inspiration, imagination, flexibility, intuition and dedication - to name a few. Trust, bonding, pleasure and quality of life influence more strongly the decisions of a person who 'ticks' in polychronic time. Morden (1999) provides a comparison of monochronic and polychronic characteristics, as is shown in Table 2.1 below.

Table 2.1 *Monochronic and polychronic characteristics*

Monochronic and Polychronic Characteristics	
Monochronic	*Polychronic*
Introvert	Extrovert
Patient	Impatient
Quiet	Talkative
Minds own business	Inquisitive/interfering
Likes privacy	Gregarious
Plans ahead methodically	Plans great outline/"vision"
Does one thing at a time	Does several things at once
Follows systems	Mixes systems
Works fixed hours	Works any hours
Punctual	Unpunctual
Dominated by timetables and schedules	Timetable unpredictable
Compartmentalised projects	Lets one project influence another
Sticks to plans	Changes plans
Sticks to facts	Juggles facts

Monochronic and Polychronic Characteristics	
Monochronic	*Polychronic*
Gets information from statistics, reference books, database	Gets first-hand, oral information
Job orientation	People orientated
Works with department	Goes around all departments
Follows correct procedures	Pulls strings
Accept favours reluctantly if at all	Seeks favours
Plays role within team	Plays as many roles as possible
Delegates to competent colleagues	Delegates to relations
Complete action sequence	Complete human transactions
Uses fixed agendas	Inter-relates agendas
Focus communication, to the point	Talks for hours
Writes memoranda, uses written record	Dislikes writing too much, prefers flexibility to commitment
Respects officialdom	Seeks out (top) key person

Source: Morden (1999:24)

The characteristics listed in Table 2.1 should not be interpreted as good or bad, but simply as being different for different people. In certain circumstances polychronic behaviour will favour superior organisation performance, and in other circumstances monochronic behaviour would be preferred. Morden (1999) suggests that the mixing, or collaboration, between people of monochronic orientations together with people of polychronic orientations, may give rise to constant culture clash and disagreement within an organisation or a team.

2.2   The chronicity continuum

The two types of behavioural tendencies, referred to as polychronicity and monochronicity, are both present to varying degrees in the workplace; they are likely to exist side by side in many work environments and may be a source of conflict because of their contrasting approaches to time management (Kaufman-Scarborough *et al*., 1999). These two concepts are not mutually exclusive and, theoretically, could co-exist in any organisation at any point in time. The basic concept of monochronic/polychronic time/culture orientation implies a continuum with "pure" monochronicity as an extreme at the one end and "pure" polychronicity as an extreme at the other end. This is illustrated in the following schematic (Bluedorn, *et al*., 1992).

Figure 2.1   *Monochronic/Polychronic Time Use Continuum*

Monochronic   Polychronic

◄───►

One activity is
engaged in during
a given time period

Some activities may be performed
simultaneously or intermittently, while
other activities are performed one
time. Individuals may vary along a
continuum in the amount of their time
spent in either polychronic or monochronic
time use.

Two or more activities
are engaged in
simultaneously or
intermittently
during a given time period

Source: Bluedorn, Kaufman & Lane. (1992:4).

2.3   The role of National, Organisational and Individual Culture

Previous research (Norris, *et al.*, 2005; Brislin and Kim, 2003; Morden, 1999; Hall and
Hall, 1987) showed that people's value system about the time dimension varies
significantly.   Morden (1999) provides an overview of models of national culture and
highlights specific differences between them within the context of the process and
practice of management. He explains monochronic cultures as those that act in a
focused manner, concentrating on one thing at a time within a set time scale. To such
people time is a scarce resource which has its opportunity cost. There may be a
perception that time is money.

On the other hand he refers to polychronic cultures that are flexible and unconstrained
by concerns with time. Polychronic people do many things at once, often in an
unplanned or opportunistic sequence. They may not be interested in time schedules or
concepts of punctuality. Time is neither seen as a resource nor as an opportunity cost
that equates to money. Research by Norris, *et al.,* (2005) supports the notion that time
management dimensions may be more effective in improving job performance
perceptions and job satisfaction in certain cultures than in others.   Furthermore, the
impact that time management practices have on job performance was more evident for
individuals who were polychronic as compared to monochronics, regardless of cultural
differences. In their research review, Brislin and Kim (2003:363) ask the question, "What
comes first? Do people control time or does time control people?" In reviewing cultural
approaches that involve time, Brislin and Kim (2003) distinguish between two clusters of
five related issues each. Each of these issues represents an aspect of different cultural

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interpretation or preference. One cluster relates to clock versus event time distinction. Its cluster issues are clock and event time, punctuality, task and social time during the workday, polychronic and monochronic time, and work and leisure time. The other cluster focuses on the pace of life. Its cluster issues are fast and slow paces of life, dealing with long periods of silence, past, present and future orientation, time as a symbol, and time efficiency (deadlines). These two clusters, the unit basis of time and the pace of life, form two useful dimensions to describe the work environment, as well as the qualities of a person in that work environment.

2.4   Creating Meaning of Polychronic Behaviour in the workplace

Cotte and Ratneshwar (1999) maintain that the meaning of time and polychronic behaviour will not be interpreted similarly by all individuals, but in accordance with each individual's life experience. Cotte and Ratneshwar's (1999) research approach assumes that created meaning for an individual is a mix of interpretations, discourses, or frameworks. These discourses are used by the individual to link together the behaviour, the cultural situation, the social situation, and the individual. Three particularly interesting factors influencing the meaning of time are:

1. culture
2. social and work groups
3. the individual's personality

An individual forms meaning of concepts through a process of social construction during social and work life experiences. This process is constantly forming and changing meaning, based on complex interactions between individuals and the need to create meaning and communication (Cotte and Ratneshwar, 1999). Through the influences of culture group, work group and individual personality the meaning of polychronic behaviour is created for each individual according to the schematic shown in Figure 2.2:

Figure 2:2 *Creating meaning of polychronic behaviour*
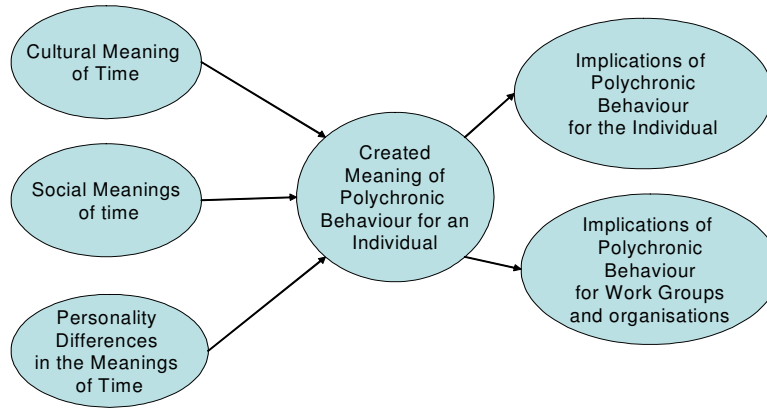
Source: Cotte and Ratneshwar (1999:185).

Why should managers be concerned about the meaning of polychronic behaviour? Imagine a situation where polychronicity becomes the work group norm for behaviour due to positive meaning creation of the original members, and subsequent socialization of this meaning to new members. Polychronic behaviour in the real world is used to "add time" to a day, producing more within the workday than if they have approached tasks monochronically (Slocombe and Bluedorn, 1999; Onken, 1999; Kaufmann- Scarborough and Lindquist, 1999).

There are also other hidden "talents" locked up in the concept, for example, individuals who preferred involvement with multiple tasks exhibited higher creativity in a task rotation environment, whereas those who preferred involvement with fewer tasks exhibited higher creativity in the sequential task environment (Madjar and Oldham, 2006).

The importance of the work environment in the process of meaning creation by the individual is also emphasized in the research by Bond and Feather (1988). They studied time structure and purpose in the use of time. Structure in this context refers to the degree to which individuals plan and schedule their use of time. They explain how the individuals' perception of time is used as an important psychological variable. For

example, the work environment involves five broad categories of experience that are enforced on employees. These are time structure, expansion of the scope of social experience into areas less emotionally charged than family life, participation in a collective purpose or effort, the assignment by virtue of employment of status and identity, and regular activity. (Bond and Feather, 1988). To the extent that these categories have become a psychological requirement in modern life, the unemployed will suffer from their absence and experience psychological deprivation. By implication, therefore, the workplace that an organisation creates, offers its employees a means to satisfy these psychological requirements of modern life.

2.5   Influence of Time Orientation on Organisational Performance

Polychronicity or monochronicity have been shown to be an integral part of a national culture (and ethnicity), where ethnicity is treated as a sub-group of a national culture. Cunha and Cunha (2004) investigated the pressure on Portuguese managers towards the adoption of so-called "Northern Time". Their findings suggested the existence of cognitive dissonance between national culture and professional culture.   The polychronicity of Portuguese culture is being challenged by pressures for the adoption of the monochronic ethos of managerial best practice as described in the models imported from the USA and northern European countries (Usunier, 1991). In the study by Cunha and Cunha (2004) the focus is on the need to find a space where the cultural propensity to a flexible relationship with time combines with the expected rigor in the execution of plans and the accomplishment of deadlines. An important finding from the study by Cunha and Cunha (2004) is the observation that divergence in relation to the monochronic orientation to time may simply be viewed as incompetence by managers in organisations.

This finding corresponds with a research study on cultural influences among white and black managers in South Africa, and which found significant subcultural differences (Booysen, 2001a; Booysen, 2001b and Booysen, 2002). Booysen (2001a) examined the differences between white (Eurocentric) and black (Afrocentric) South African managers. The author contended that these differences could become a strength and a competitive advantage if reconciled and integrated, or a primary source of misunderstanding if not managed correctly. Booysen (2001a) found that:

a. Black managers measured higher than white managers in the area of collectivism,

b. White managers measured higher than black managers on uncertainty avoidance,

c. White managers measured higher than black managers on future orientation,

d. Both black and white managers measured above average on power distance.

The following conclusion by Booysen (2001a:58) is relevant to this study:

"In order to build a corporate multicultural identity, a strategy for managing cultural diversity is required. This strategy would have to build consensual realities through an acute awareness and understanding of the differences and commonalities in cultural preferences of the diverse cultural forces present in the organisation. The common vision should emerge from the perception of a common identity and shared values through a culture of valuing diversity" and "Transformation must be systemic and a holistic approach should be applied to change organisational practices, procedures, systems, strategies and leadership, as well as individual attitudes and values, so that we can ultimately achieve a culture of valuing diversity, and organisational effectiveness."

A similar polarization between white South Africans and (black) Africans is indicated in a suggested Monochronic – Polychronic demographic scale (Morden, 1999) in Table 2.2 below. The positions of white South Africans and Africans (black) are highlighted to emphasize the relative polarization due to their relative positions on the scale.

This implied polarization is in keeping with the results from a study by Munene, Schwartz & Smith (2000:339) where it was found that "black sub-Sahara African culture emphasizes hierarchy, embeddedness and mastery in contrast to egalitarianism, autonomy and harmony. Further evidence reveals that African managers stress reliance on formal rules and superiors in reaching decisions, as predicted by their cultural profile. Comparisons with Western European samples indicate that these nations have the opposite cultural profile and that their managers stress self-reliance and consultation with subordinates".

These findings suggest a very definite link between the cultural traits of an organisation and individuals in the organisation, people's time orientation as one of the characteristics of their cultural traits, and impact on the organisation's operational and business efficiencies. This link is now further explored in the next section.

Table 2.2 *A suggested Monochronic/Polychronic Demographic Scale*

Monochronic

•Germans, Swiss, Austrians
•Americans (White Anglo-Saxon Protestant or WASP)
•Scandinavians, Finns
•British, Canadians, New Zealanders
•Australians, **(white) South Africans**
•Japanese
•Dutch, Flemish Belgian
•Other American cultures
•French, Walloon Belgian
•Koreans, Taiwanese, Singaporeans
•Czechs, Slovakians, Slovenians, Croats, Hungarians
•Chinese
•Northern Italians
•Chilean
•Other Slavs
•Portuguese
•Spanish, Southern Italians, Mediterranean peoples
•Indians, and other Indian sub-continent
•Polynesians
•Latin Americans, Arabs, **Africans**

(left axis label: **Continuum**)

Polychronic

Source: Adapted from Morden (1999:24)

2.6 Interplay of time orientation between organisational and individual levels

Researchers investigated the impact of polychronicity, as a temporal dimension of organisational culture, on organisational behaviour (Slocombe and Bluedorn, 1999) and organisational performance (Onken, 1999).

Slocombe and Bluedorn (1999) investigated several individual outcome variables as a function of the congruence between an individual's preferred pattern of polychronic time utilisation and the pattern he or she actually experiences arising from workplace demands. They found that:

1. the individual's willingness to exert effort was highest when preferred polychronicity and experienced work-unit polychronicity were both high,
2. the individuals desire to remain a member of the organisation was greatest when preferred polychronicity equaled or exceeded experienced work-unit polychronicity,
3. for a given level of preferred polychronicity, the belief in and acceptance of organisational goals was greatest when preferred polychronicity and experienced work-unit polychronicity were equal,
4. when preferred polychronicity and experienced work-unit polychronicity were both high, individual performance evaluation was perceived to be higher when experienced work-unit polychronicity was somewhat higher than preferred polychronicity,
5. for a given level of preferred polychronicity the perceived fairness of one's performance evaluation was greatest when preferred polychronicity and experienced polychronicity were equal.

These results support the belief that individual time and temporal variables share important associations with organisational behaviour and may have important implications for both individual and organisational performance and effectiveness. This study by Slocombe and Bluedorn (1999) also confirms the importance of polychronicity as an explanatory agent in organisational affairs and some of the mechanisms by which polychronicity can have a positive impact in organisational and operational efficiencies.

Onken (1999) examined polychronicity and speed values, as temporal elements of organisational culture, and their effects on organisational performance. Speed in this

context refers to the speed at which individuals in an organisation accomplish tasks and the values attached to doing so. Onken (1999) found that polychronicity and speed dimensions of organisational culture are positively correlated. Also, the more polychronic an organisation's culture, or the more the organisation's culture values speed, the better its performance. These results were found to be more pronounced in the case of non-hypercompetitive industries than in hypercompetitive industries, thereby indicating that speed can be used as a competitive advantage in non-hypercompetitive industries. In the case of hyper-competitive industries, speed of performing activities and making decisions become a hygiene factor, meaning that speed needs to exist just for the firm to survive in that industry. In this situation speed as such does not necessarily provide a competitive advantage.

The polychronicity and speed dimensions of culture are complemented by other temporal dimensions of culture such as time urgency, or awareness of individuals and timing and pacing of group activities (Waller, Giambatista & Zellmer-Bruhn, 1998). Results from a real life simulation by Waller, *et al.,* based on a creative task to be performed by different groups of three to four members each, indicate a negative association between individual time urgency and group polychronic behaviour (Waller *et al.,* 1998). Time urgent individuals in a group are associated with fewer deviations from monochronic progress through phases of the group's problem-solving process. They serve to keep the group focused on the primary task while marching sequentially through phases of group problem solving. This study did not relate this phenomenon with organisational performance. Given the fact that it was based on a simulated reality outside the pressures of a real organisation, it is not possible to extrapolate the results beyond the simulated environment.

2.7 Polychronicity as a multi-dimensional construct

Research on polychronicity generally treats time use preference, context and time tangibility as isomorphic variables that can be represented on a single continuum. These three dimensions, typically associated with the construct of polychronicity, can be defined as:

  a. *Time Use Preference;* refers to the extent to which people prefer to engage in multiple tasks simultaneously.

b. *Context;* refers to the location of meaning in a message. For example, in low context communication most of the information and meaning is contained in the content of the message, while in high context communication most of the information and meaning is embedded in the information that surrounds the event, Context is inextricably bound up with the meaning of that event.

c. *Time tangibility;* is expressed in the fact that time is considered to be a commodity that can be bought, sold, wasted, saved, and spent. A tangible resource that can be deployed and managed.

Research by Palmer and Schoorman (1998) indicated that these dimensions of polychronicity are independent from each other. They found that correlations among the variables and confirmatory factor analyses provide support for the multi-dimensional view of polychronicity. Further classification provided evidence that eight possible configurations of the three variables can and do exist. The most frequent "type" reflected a polyphasic time use preference, low context and high time tangible profile. This profile fits the description of Type A behaviour pattern (Palmer and Schoorman*,* 1998). Type A behaviour, also known as coronary prone behaviour, was introduced nearly five decades ago by two cardiac physicians (Friedman and Rosenman, 1974), who attempted to explain the link between high-pressure job environments and coronary heart disease. Friedman and Rosenman (1974:67) described Type A individuals as "aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time". Type A's have also been characterized as extremely time driven; impatient, time pressured, and obsessed with deadlines (Lee, *et al.*, 1988; Conte, Rizzuto and Steiner, 1998; Kunnannatt, 2003). Treating polychronicity as a subcomponent of Type A behaviour, Ishizaka, Marshall & Conte (2001) found it to be significantly correlated with competitiveness and task-related hurry.

Type A behaviour amongst university academic staff was found to be significantly and positively correlated with monochronic behaviours, in other words, Type A's were more likely to use behavioural strategies that reduced polychronic thought (Frei, Racicot & Travagline, 1999). Type A and monochronic behaviours were also significantly correlated with job-induced stress and number of publications. Contrary to the hypothesis, Type A and monochronic behaviours were also positively and significantly correlated with number of working projects in progress.

These findings provide evidence that it is inappropriate to use the dimensions of time use preference, context and time tangibility as isomorphic variables that can be used interchangeably. Future research should be more specific about the conceptual and operational definition of the construct that is of interest.

Research results obtained by König, Büher & Mürling (2005), indicated that different empirical outcomes can be expected if polychronicity is seen as a macro type of multi-tasking, as opposed to a more micro type multi-tasking; or when subjective multi-tasking performance is investigated as opposed to objective multi-tasking performance.

2.8   Time Management in Organisations

Kaufmann-Scarborough *et al.,* (1999) indicated that good time management in the traditional sense appears to be linked with orderly behaviour, with conscious ordering, sequencing, and combining all of the activities during the time that is available. Such an approach assumes that time is generally used for one purpose within a given clock block, that activities are sequenced and time is measured objectively in hours and minutes. This approach to time management corresponds with the approach described in the PMBOK project management framework (PMBOK® guide, 2004). Management methods, mainly originating in the USA (Usunier, 1991), favour pure monochronic organisation.   For example, PERT programming, an economic time device used generally in project management, is designed to reduce a universe of polychronic tasks to a monochronic solution, called the critical path.

Cunha and Cunha (2004) argue for a more pragmatic approach in polychronic work environments where the cultural propensity to a flexible relationship with time combines with rigor in the execution of plans and the accomplishments of deadlines. Likewise, Booysen (2001a) recommends the development and implementation of organisational and business strategy that is built on consensual realities through an acute awareness and understanding of the differences and commonalities in cultural preferences of the diverse cultural forces present in the organisation.

All these arguments form a groundswell of support for a more integrative and holistic management approach to individual, group and organisational performance management in a globalised economy where cultural diversity become more common

place in organisations and in work groups. An approach where the cultural dimensions of individuals, organisations and countries are taken into account and where diversity is used as a competitive advantage.

2.9   Job fit, outcomes and satisfaction amidst polychronicity

Hecht and Allen (2003) related polychronicity to person-job fit and performance. Their research focused on the extent to which person-job fit, with respect to polychronicity, is related to individual level work place outcomes. Secondly, they explored whether person-job fit on the dimension of polychronicity had a stronger relationship with outcomes when the manner in which time is allocated to tasks is important to individuals than when it is not. They found that person-job fit with respect to polychronicity is related to job performance and to certain aspects of well-being such as job satisfaction and life satisfaction at the level of the individual. More specifically, misfit (either higher or lower) was related to lower performance satisfaction than person-job fit. Also, Satisfaction (job and life) seemed higher when preferences were matched with demands, and decrements seemed to occur when demands and preferences were mismatched. These effects are driven by those individuals who place a high importance on the way in which their time is allocated to tasks.

In a more rigorous investigation of time management practices and job outcomes, Norris, *et al.*, (2005) focused on the comparison of monochronic and polychronic time cultures with regard to time management and its influence on key job outcomes. Their study compared and contrasts management practices of employees in the US (a Western culture) and Sri Lanka (a South Asian culture). They found that managing time is important in both cultures, not just in Western culture as is often implied. Partial correlation coefficients also indicated that selected time management dimensions may be more effective in improving job performance perceptions and job satisfaction in certain cultures than other. This finding has implications for training seminars on time management. Furthermore, the impact that time management practices have on job performance was more evident for individuals who were polychronics as compared to monochronics, regardless of other cultural differences. For example, as companies downsize and encourage work teams to do more with less and much quicker, they effectively encourage polychronic behaviour. The implications of this study are (Norris, *et al.*, 2005):

a. Since time management practices result in positive job outcomes for only polychronics and not monochronics, time management training of employees that perform a customer service function should be directed mostly at the polychronics and not necessarily at the monochronics.

b. Even though the cultural context to a large extent influences temporal perception and behaviour of individuals, these perceptions and behaviours seem to change with the passage of time. Even if employee's temporal perceptions and behaviours are more polychronic than monochronic, it can be changed to help these individuals to be more efficient and improve their level of performance and satisfaction with their job.

Investigating the impact of polychronicity on Absence from work, Lateness and Supervisory Performance Rating, Conte and Jacobs (2003) found that polychronicity was positively related to objective measures of both lateness and absence. These findings are consistent with Hall's (1983) observation that individuals in polychronic cultures follow appointments and schedules less closely than those in monochronic cultures. However, these results are the first to provide empirical evidence of such a relationship at the individual level of analysis. Polychronicity was also significantly, negatively correlated with a composite measure of supervisory performance ratings that assessed dependability, schedule adherence, and attentiveness on the job. Thus, polychronicity was significantly associated with both objective and subjective measures of job performance.

2.10 *Measuring instruments for temporal orientation and polychronicity*

Questionnaires for measuring temporal orientation and polychronicity has been developed, tested and used in previous research studies. These questionnaires and their use are discussed in Chapter Four.

2.11 *Conclusion*

From the above discussion it is clear that people's perceptions and preferences towards the concept of time is not a singularly defined concept, but a relative concept. For some it is almost a tangible resource that becomes the paramount priority around which other

priorities are arranged. For others it is a recurring phenomenon that is subservient to the importance of relationships (Hall, 1987). This means that time management, one of the pillars of contemporary project management (PMBOK® guide, 2004), is exposed to a much wider interpretation, than typically recognised. This situation is underpinned by the following concerns:

a. The Clinical Research Associates (CRA's) apply project management principles through a very structured set of Standard Operating Procedures (SOP's). These SOP's are based on the experimental design requirements of the trial, quality assurance considerations, regulatory frameworks and business considerations. It does not necessarily recognise cultural differences of the CRA's and the environments in which trials are executed. The question is how widely do CRA's vary in terms of their temporal orientation?

b. A variation in the time orientation of a CRA does indicate a cultural diversity in an organisation that would require a certain level of understanding and recognition from the side of management. The impact of such organisational cultural diversity may require certain changes to traditional management styles and approaches.

The above discussions suggest that the impact of a person's polychronic or monochronic time style tendency or time orientation is a potentially important consideration in understanding his or her personal approach to time management in the work place. Time management is complex and multi-dimensional. Both polychronic and monochronic people attempt to manage their time in ways which are compatible with their own time orientation.

American management methods exported throughout the world emphasizes a monochronic approach. (Cotte and Ratneshwar, 1999; Usunier, 1991). The PMBOK® project management knowledge framework is an example of such a monochronic management approach.

2.11.1   Implications for South African Clinical Trial Projects

The arguments made above represent possible areas of conflict, due to multiple time orientations of people, in executing clinical trial projects in the multicultural environment

of South Africa. The purpose of the study is to identify possible areas of non-alignment in the approaches and expectations of managers of clinical research projects (CTM's) and that of their project staff members (CRA's). Such areas of non-alignment represent areas of efficiency improvement in the way people manage clinical trials.

The next chapter discusses in more detail the PMBOK® project management environment in an organisation, and its associated performance measurement approaches, which forms the context within which CRA's operate in the clinical trial industry.

Chapter 3: Project Management and Organisational Culture

3.1 Introduction

Project Management that is based on the PMBOK® (Project Management Body of Knowledge) framework values the execution of projects on brief, on budget, on time, and on the basis of healthy interrelationships between project team members. The PMBOK® framework (PMBOK® guide, 2004) is an American National Standard (ANSI/PMI 99-001-2004) and is widely used in project management in various industries world wide (Haugan, 2006) and in South Africa, including the pharmaceutical industry. In terms of the PMBOK® framework project time management includes the processes required to accomplish timely completion of a project. It involves the sequencing of activities, activity resource estimation, activity duration estimation, scheduling and control of these resources and schedules. The process treats time as a finite resource that expires linearly and which is sequenced in different ways, allocated to tasks and managed according to a predetermined schedule. Project staff members are assigned certain roles and responsibilities within these activities and their performance is measured according to the specific project's performance evaluation framework. Project quality is controlled within certain specified tolerances and control limits on the critical parameters that are defined in the planning stages of the project. These parameters typically include, amongst others, project time and budget.

3.2 What is a project?

Organisations perform work to achieve a set of objectives. Work generally involves either operations or projects, although the two may overlap. Operations and projects share some characteristics, for example, they are:

- performed by people
- constrained by limited resources
- planned, executed and controlled

Operations and projects differ primarily in that operations are ongoing and repetitive while projects are temporary and unique. The objectives of projects and operations are fundamentally different. The purpose of a project is to attain its objective and then terminate. Conversely, the objective of an ongoing operation is to sustain the business.

Projects are different because the project concludes when its specific objectives have been attained, while operations adopt a new set of objectives and the work continues.

Projects are undertaken at all levels of the organisation and they can involve a single person or many thousands. Their duration ranges from a few weeks to several years. Projects can involve one or many organisational units, such as joint ventures and partnerships.

Every project has a definite beginning and a definite end (PMBOK® guide, 2004). Projects are influenced by the maturity of the organisation with respect to project management, culture, style, and organisational structure.

3.3   *Project Management*

In addition to the information provided in the definitions of section 1.4, the following are relevant:

High quality projects deliver the required product, service or result within scope, on time, and within budget (PMBOK® guide, 2004). The relationship amongst these three factors is such that if any of these factors changes, at least one other factor is likely to be affected. Project managers also manage projects in response to uncertainty. Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one project objective. The project management team has a professional responsibility to its stakeholders including customers, the performing organisation, and the public. Many of the processes within project management are iterative because of the existence of, and necessity for, progressive elaboration in a project throughout the project's life cycle. That is, as a project management team learns more about a project, the team can then manage to a greater level of detail.

The term project management is sometimes used to describe an organisational or managerial approach to the management of projects and some ongoing operations, which can be redefined as projects that is also referred to as "management by projects" (PMBOK® guide, 2004). An organisation that adopts this approach defines its activities as projects in a way that is consistent with the definition of a project. There has been a tendency in recent years to manage more activities in more application areas using project management. This is not to say that all operations or should be organised into

projects. The adoption of "management by project" is also related to the adoption of an organisational culture that is close to a project management culture.

3.4   *Project Management Culture*

Projects are typically part of an organisation that is larger than the project. Even when the project is external, the project will still be influenced by the organisation or organisations that initiated it. The maturity of the organisation with respect to its project management system, culture, style, organisational structure and project management office can also influence the project, for example (Zwikael, Shimizu & Globerson, 2005), Israeli project managers are more focused on performing "Scope" and "Time" management processes, assisted by project management software, while formal "Communications" and "Cost" management are more frequently used by Japanese project managers. It was also found that Japanese organizations use clear and measurable success measures for each project, while project objectives in Israel are often quite foggy. Differences in efforts made by project managers and management are manifested by smaller costs and schedule overruns in Japanese organizations, while Israeli customers of local projects seem to obtain better technical performance at the end of the project. The Israeli customer, however, is much more impacted by superior technical performance and easily forgives cost and schedule overruns.

Muriithi and Crawford (2003) researched the applicability of project management approaches, as represented in the most widely distributed and accepted knowledge and practice guides (PMBOK [®] guide, 2004 and Australian National Competency Standards for Project Management) to projects in developing and emerging economies. Focusing on East Africa, they identified that local realities such as the need to cope with political and community demands on project resources, recognition that economic rationality and efficiency, assumed as a basis for many project management tools and techniques does not reflect local realities; and that use of such tools and techniques will not enhance project success if they run counter to cultural and work values.

3.4.1 Organisational Systems

Project-based organisations are those whose operations consist primarily of projects. These organisations fall into two categories (PMBOK[®] guide, 2004):
- Organisations that derive their revenue primarily from performing projects for others under contract.

- Organisations that have adopted "management by projects". These organisations tend to have management systems in place to facilitate project management.

Non-project-based organisations often lack management systems designed to support project needs efficiently and effectively. The absence of project-oriented systems usually makes project management more difficult. In some cases, non-project-based organisations will have departments or other sub-units that operate as project-based organisations with systems to support them. The project management team should be aware of how its organisations structure and systems affect the project.

3.4.2 Organisational Culture and Style

Most organisations have developed unique and desirable cultures. These cultures are reflected in numerous factors, including but not limited to (PMBOK® guide, 2004):
- Shared values, norms, beliefs and expectations
- Policies and procedures
- View of authority relationships
- Work ethic and work hours

Organisational cultures often have a direct influence on the project, for example:
- A team proposing a usual or high-risk approach is more likely to secure approval in an aggressive or entrepreneurial organisation
- A project manager with a highly participative style is apt to encounter problems in a rigidly hierarchical organisation, while a project manager with an authoritarian style will be equally challenged in a participative organisation.

Empirical evidence on the characteristics of the critical success or failure factors in project management as a result of different organisational environments supports the idea that a project manager can identify and eliminate the factors that have a negative effect on their performance, and that communication is an essential tool in this process (Hyväri, 2006).

3.4.3 Organisational Structure

The structure of the performing organisation often constrains the availability of resources in a spectrum from functional to projectised, with a variety of matrix structures in between (PMBOK® guide, 2004).

The classic functional organisation is a hierarchy where each employee has one clear superior. Staff members are grouped by specialty.

At the opposite end of the spectrum is the projectised organisation where team members are often co-located. Most of the organisation's resources are involved in project work, and project managers have a great deal of independence and authority.

Matrix organisations are a blend of functional and projectised characteristics. Weak matrices maintain many of the characteristics of a functional organisation and the project manager role is more that of a coordinator or expediter than that of a manager. Strong matrices have many of the characteristics of the projectised organisation. While the balanced matrix organisation recognises the need for a project manager, it does not provide the project manager with the full authority over the project and project funding.

3.5   Evaluation of project outcomes

Project outcomes are generally evaluated in the context of the well established behaviour-performance-outcome (B-P-O) cycle (Liu, 1998). Behaviour in the cycle relates to the behaviour of the individual and has been defined as an ongoing act or process (Naylor, Pritchard & Ilgen, 1980). In this phenomenological study, Liu (1998) argued that organisational behaviour is the aggregate behaviour of individuals in the organisation, rather than a concept of an organisation having a behavioural pattern. Performance refers to the successful accomplishment of task goals. Performance evaluation describes performance strengths and weaknesses within and between individuals. The B-P-O model assumes that the basic actions of the individual are the actions of choice. Behaviour in such a context is a result of the stimulus-organism-response (S-O-R) sequence. In this study organism can be replaced by the individual. The S-O-R sequence is brought about as a result of the forces exerted by environmental forces on individuals. It is then up to the individual to react appropriately by setting, adjusting or redefining goals and actions. The S-O-R paradigm assumes that an individual is inactive until acted upon by stimuli, i.e. the stimuli cause the acts.

According to Liu (1998) project outcome evaluation refers to the achievement of project goals within a specified time frame. Each participant in the project may have his or her own interpretation of the project outcome as a function of their expectation of success, the amount of effort they are willing to exert and their expectation of the outcome. In

turn, all of these are a function of the environmental forces acting on the individual both personally and through their effect on the transformation process in the project itself. There are three approaches to determining project success:

a. Project goals - Commonly cited goals are those concerning time, budget and functionality/quality

b. Satisfaction of the claimants - role players directly involved

c. Perception and awareness of the different claimants - e.g. management versus scientific perceptions.

In all cases the evaluation process is concerned with clarity of the success criteria and consensus. Since success leads to satisfaction, the most straightforward relationship of goals to satisfaction is that the greater the success experienced relative to the goal set, the greater is the degree of satisfaction experienced. This is achieved through the following sequence of steps (Liu, 1998):

a. From the Behaviour-Performance link: - Set performance standards

b. From the Performance-Goal Attainment link: - Evaluate project outcome against these standards

c. From the Goal Attainment-Satisfaction link: - Grant rewards for Task Performance

d. From the Behaviour - Satisfaction link: - Satisfaction achieved as a function of the nature of the task itself

e. From the Satisfaction - Performance link: - a weak link theoretically and probably operates via commitment of the individual to the project.

In their case study based on research on performance measurement systems and approaches, Bititci, Mendibil, Nudrupati & Garengo (2004) found that organisational culture and management styles have an impact on how performance measurement systems are implemented and used, thus affecting its success or failure. At the same time it was found that performance management systems can affect management styles and, to a certain extent, organisational culture. Bititci, *et al.,* (2004) reported the following valuable lessons learned:

a. Successfully implemented and used performance measurement systems lead to a more participative and consultative management style.

b. The performance measurement system, once in place and in use, supported by a consultative management style at all levels, leads to greater buy-in at all levels.

c. Use of the performance measurement system to drive continuous improvement can lead to significant performance improvements. Driven by this success organisation gradually moves towards an achievement culture.

d. An authoritative management style was found to be an essential requirement in deploying the performance management system when the organisation demonstrates a power culture.

e. Performance measurement is a cross-functional issue and requires joined thinking across all levels in the organisation. A functional mindset can seriously undermine the success of a performance measurement system.

f. Managers do not readily change their management styles. External stimuli play an important role in leading to managers changing their management styles.

"Soft" skills, also referred to as "micro social" skills, are universally recognized as being critical to successful project management. Methods of measuring those skills, however, are to date largely subjective and nonsystematic. A recent study (Muzio, Fisher, Thomas & Peters, 2007) investigated soft skill quantification (SSQ), and its utility in predicting performance. The results of an SSQ assessment were compared to formal employee performance results and individual program manager observations. First, the alignment of real life employee performance with SSQ was statistically stronger than it was with manager observations. Secondly, the manager was not successful in identifying specific strong and weak skill areas for individual employees. The manager was particularly blind to the strengths of weaker performers and the weaknesses of stronger performers, both of which are essential for employee development. Finally, the SSQ instrument highlighted additional skill areas pertinent to performance that were not initially identified by the manager. In this study, the SSQ proved to be a valuable tool in characterizing and potentially improving employee performance. This pilot study supports the conclusion that the SSQ model measures characteristics related to performance, and could be used as a supplemental tool for a project manager to identify specific strengths and weaknesses of employees.

3.6 Conclusion

The practice of individual and organisational performance management had moved away from only considering financial and hard operational data as the only proxies for level of effort and success. There is an increasing trend, at least in the research

literature, to include causal factors such as organisational culture, management styles and individual motivational levels.

There is therefore an increasing awareness of the possible influence of the factors of organisational culture on project performance. Based on numerous studies that investigated the correlation and potential outcomes of polychronicity (Bluedorn, *et al.*, 1999; Conte, *et al.,* 1998; Onken, 1998), these factors of organisational culture include the impact of the relative polychronicity of individuals and the organisational environment.

The next chapter discusses the theoretical model underlying this study.

Chapter 4: Theoretical Model

4.1 Introduction

The primary purpose of this research is to quantitatively measure:

    a. The individual time orientations among the Clinical Research Associates (CRA's) in South Africa, and

    b. What South African CRA's perceive their respective organisations to expect from them in terms of time orientation

    c. How South African managers of CRA's, namely Lead CRA's or CTM's, expect CRA's to behave in terms of time orientation.

4.2 Research question and phenomenon

The fundamental question to ask from a management perspective is:

    1. What is the degree of polychronicity among Clinical Research Associates?

    2. What are the manager's expectations of CRA performance?

    3. What is the implication of differences of time perceptions of CRA's on the management of projects in a clinical research environment?

This study aims to gather an understanding of these three issues in a clinical research environment in order to provide tangible evidence with which to improve the way that CRA's are trained and managed in South Africa. In order to understand these issues, it is necessary to not only measure the variables mentioned, but also understand their interrelationships. In order to achieve this, the research problem needs to be looked at from the conceptual perspective offered in the next section.

4.3 Proposed theory or model

The published body of knowledge around monochronicity and polychronicity is mainly modeled on human behaviours and value systems within the larger context of national and organisational cultures (Bluedorn, *et al.,* 1993; Hall, 1987; Hofstede, 1984). This study assesses people's relative time orientation in the context of organisational and

individual culture and behaviour in the work place. From the cultural perspective monochronicity and polychronicity is described in terms of its influences on thinking patterns, past or present or future orientation, contextual interpretation and behavioural patterns in general. Together these frameworks have been shown in Chapters 2 and 3 to have a profound impact on the way in which traditional performance management styles and approaches could be adapted to accommodate projects in polychronic environments.

In order to create a model of the relevant constructs for this research study, it is necessary to consider the concepts underlying the phenomenon under consideration, namely the different time orientations of Lead CRA's and CTM's (who are the managers of CRA's), and the impact of possible non-alignment between the CRA's and their managers. In this situation there are three constructs of relevance, namely:

4. the CRA's personal perceptions of their own time orientations, and
5. the CRA's perceptions of what time orientation behaviour their direct managers expect from them, and
6. the CTM's expectations for the time orientation behaviour of CRA's .

Although each of these constructs represents a concept in its own right, they do relate to each other through the personal relationships that they imply, for example:

1. Each CRA has two perceptions of relevance, namely one about him or herself, and one about his or her manager (CTM or Lead CRA)
2. Each CTM has a perception and expectation about a CRA role
3. A CTMs' perception of a CRA role that may or may not be the same as the CRA's own perception about the CRA role.

These constructs and the relationships between them are summarised in the model shown in Figure 4.1 below.

Figure 4.1: *An overview of the relationships between the theoretical constructs underlying the relationships between CRA's and management (CTM's) in a multinational pharmaceutical organisation.*
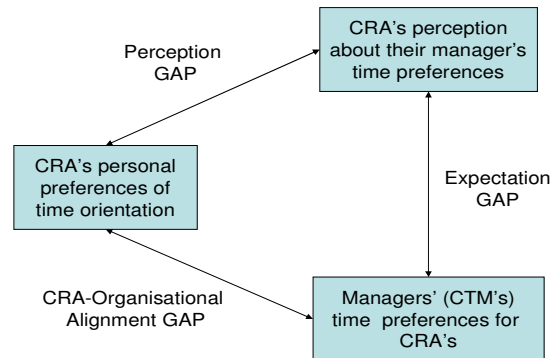
Also noted about the theoretical model shown in Figure 4.1, is the presence of potential Gaps between perceptions and expectations, for example:

1. **CRA-Organisation Alignment GAP** - represents the real degree of misalignment in time orientation between CRA's and their managers, the CTM's.
2. **Perception GAP** – represents a measure of the alignment in time orientation between the CRA's and their managers, according to the perceptions of the CRA.
3. **Expectation GAP** – this GAP qualifies what the CRA's think about their manager's expectation for themselves, and what the managers themselves expect from CRA's.

Note that the arrows in the model of Figure 4.1 do not indicate causal relationships, but simply the direction of the relevant GAP in perception or expectation.

4.4   Research Propositions

In line with the arguments put forth in Chapter 2 and 3, and the theoretical model shown in Figure 4.1, the following propositions are made:

   P1:   The CRA's have different personal preferences for time orientation
   P2:   The CRA's have different perceptions about their manager's time orientation expectations

P3:   The managers (CTM's and Lead CRA's) have different expectations for CRA's time orientation behaviour

P4:   The CRA's personal preferences for their own time orientation is significantly different from the CRA's perceptions about their manager's time orientation expectations

P5:   The CRA's personal preferences for their own time orientation is significantly different from the managers' (CTM's and Lead CRA's) own expectations about time orientation behaviour

P6:   The CRA's perceptions about their manager's time orientation expectation is significantly different from the manager's (CTM's) own expectations for time orientation behaviour

Propositions P1, P2 and P3 deals with the characteristics of the three sample groups and is derived from the management perspective that people have different temporal perspectives and modes of operation that relates to cultural profiles, according to the published research literature (Norris, *et al*., 2005). Therefore, for a multi-cultural country like South Africa it is to be expected to see significant variation in each of the sample groups.

Propositions P4, P5 and P6 is based on the expectation that diverse time orientations and temporal perspectives amongst employees will manifest in possible misalignment between managers and subordinates, assuming that the managers of a project based organisation, such as a Clinical Research Organisation, will manage according to a strict time tangible, or monochronic, approach (e.g. PMBOK ® guide, 2004; Zwikael, *et al.,* 2005).

The following chapter explains the research methodology and design to be followed in this research study.

Chapter 5: Research Methodology and Design

Method of study

This study is based on a descriptive cross-sectional study yielding quantitative data with respect to the relative perceptions and expectations of time orientations of the respondents as it is. It does not intend to determine cause-and-effect relationships.

The study will use a questionnaire to collect data from the sample group. The questionnaire will be implemented as a web based form to be filled in by the respondents.

Target population and sampling frame

This study is very specifically oriented towards the opinions of CRA's because they are the project managers of clinical trials. The population of CRA's and clinical trial Managers registered with the South African Clinical Research Association (SACRA) is a very well defined entity. For the association under consideration there are 199 CRA's. The study will include all the CRA's registered with SACRA. Likewise, the study will include all the CTM's and Lead CRA's registered with SACRA. There is 65 actively practicing Clinical Trial Managers registered at SACRA. Therefore the overall population that is sampled in this study is 264 professionals in the Clinical Research Industry in South Africa.

This entire population has been notified of this research study and invited to participate in the study by responding to the IPV instrument. The sum of all respondents in the final data set was 112 and that defines the sample size for this research study. This is equivalent to a sample size of 42% of the population.

Data collection

A structured questionnaire has been used to perform a quantitative survey of CRA's and their managers (CTM's or Lead CRA's) to determine their perceptions and expectations with respect to time orientation.

E-mails were sent out to the entire sample of CRA's and CTM's registered at the South African Clinical Research Association (SACRA). This population is approximately equivalent to the entire population of CRA's and CTM's practicing in South Africa. The e-mail contained a cover letter to explain the purpose of the survey, the value each of the respondents would receive from participating in this survey, instructions of how to access and respond to the questionnaire, and an appropriate word of appreciation. The cover letter sent out to respondents is shown in Appendix 1.

The survey employed a web based questionnaire that was published on the World Wide Web for the target audience during the agreed period over which the survey took place. A survey report was generated from the database that contained respondent scores in which the data was collated and formatted for further analysis.

Secondary data was sourced from peer reviewed published journals.

Assumptions

It is assumed that:
- in executing their managerial duties CTM's behave and make decisions on the basis of the organisation's Standard Operating Procedures.
- CRA's in multi-cultural South Africa displays a range of time orientations as measured on a polychronicity scale.
- CRA's differ from their managers in their perceptions on the temporal behaviours their managers expect from them.

Reasons for these methods

CRA's and CTM's are well equipped with laptop computers and are used to work either directly onto company wireless area network (WAN's) or local area network (LAN's), or via dial up modems. Therefore, using electronic questionnaires was more convenient for the respondents and the researcher. Further more, the following advantages and disadvantages apply to surveys based on questionnaires (Neuman, 2000):

Advantages:

1. Researcher can give questionnaires directly to respondents who read the instructions and questions.
2. This type of survey is the cheapest and can be conducted by a single researcher.
3. The researcher can send questionnaires to a wide geographical area.
4. Respondents can complete the responses at their convenience.
5. Web based questionnaires offer anonymity and avoids interviewer bias.

Disadvantages:

1. This approach has a relatively low response rate associated with it. Response rates can be raised by sending out reminding notes.
2. The researcher cannot control the conditions under which the questionnaire is completed.
3. Researchers cannot visually observe the respondents' reactions to questions.
4. This format limits the kinds of questions that can be used. Questions requiring visual aids, open-ended questions, and complex questions do poorly in mail questionnaires.

Proposed research instrument

Measuring instruments for temporal orientation and polychronicity

Kaufman, Lane & Lindquist (1991) developed a scale called the Polychronicity Attitude Index (PAI) which attempted to capture the respondent's general attitude toward performing more than one activity at a time. The PAI comprises of a four item scale and was used by Bluedorn and co-workers (Bluedorn et al, 1998) to expand on it in developing the Inventory of Polychronic Values. The PAI-scale is presented in Table 5.1 below.

Although the alpha coefficient reported for the PAI scale, 0.68, was lower than Nunnally's (1978) recommended 0.80 for basic research, their work provided a pool of initial items that were used by Bluedorn, *et al*., (1998) to develop a more expanded scale measuring the extend to which an organisation's culture is polychronic. They developed a ten item scale called the Inventory of Polychronic Values (IPV). This scale was

developed using data from 11 samples (N=2190) collected from bank employees, undergraduate students, hospital personnel, dentists and their staff, and state agency managers. Principal components alpha (they achieved an alpha of 0.84), correlation and confirmatory factor analyses supported the IPV in its internal consistency, test-retest reliability, content adequacy, construct validity, and nomological value. The IPV is shown in Appendix 3.

Table 5.1: The Polychronic Attitude Index scale

Polychronic attitude index   Note: (R) means the score should be read in reverse

Item	5 Strongly disagree	4 disagree	3 Neutral	2 Agree	1 Strongly Agree
I do not like to juggle several activities at the same time					
People should not try to do many things at once					
When I sit down at my desk I work on one project at a time					
I am comfortable doing several projects at the same time (R)					

Source: Bluedorn, Kaufman, & Lane (1992:20)

Testing validity of the scale

Test-retest reliability yielded a principle components alpha coefficient of 0.84 (Bluedorn, *et al.*, 1998). Content Adequacy (Validity) assessment was done according to Stephenson's (1953) Q-methodology and accepted on the basis of high correlations in all four content categories required. A known-groups test for Content Adequacy was also performed. The IPV qualified this test with very high values of Wilk's lambda at $p<0.001$. IPV's construct validity was measured by assessing IPV's homogeneity and its discriminant and convergent validity based on a large pool of data from three samples. Homogeneity indicates whether a scale's items assess a single underlying factor or construct. If each item in a scale is a different source or measure of the construct it is designed to measure, evidence of scale homogeneity can be interpreted as a form of convergent validity. The data pool was subjected to confirmatory factor analysis to identify the most parsimonious factor structure (number of factors) that provided a good fit with the data. Next a test of partial model invariance was conducted across the three

samples to examine the stability of both the factor structure and the pattern of factor loadings. Overall the IPV were found to possess a single theoretical factor, polychronicity. Discriminant validity refers to the ability to differentiate a construct from other constructs that may be similar. The IPV was also subjected to so-called Nomological validity testing. This is done by testing a Nomological net to support claims for a scale's construct validity, a Nomological net being the interlocking system of laws constituting a theory. Results strongly and consistently supported the IPV's Nomological validity.

The authors of the IPV (Bluedorn, *et al.*, 1998) indicate that the IPV can be easily modified to provide an equally valid and reliable measure of individual-level polychronicity. To do so, the word "we" in each of the ten statements (see Appendix 3) is simply changed to "I" and "ourselves" is changed to "myself" in item 4, which alters the referent from a group (i.e. department, organization, etc.) to the individual respondent. The instructions in the questionnaire would also be changed to direct respondents to answer the ten questions about themselves. Alpha coefficients calculated for the individual version of the IPV in these unpublished data were comparable to the alpha coefficients for the cultural-level coefficients reported in this article.

In this study the IPV Scale was adopted to provide an "I" focus for CRA's about themselves, and a "my manager" focus about what they think their managers expect from them, and a "CRA focus" for CTM's. The adapted scales are shown in Appendix 3.

5.7   Demographic data capture

In order to relate the time preferences of respondents to cultural and demographic characteristics on an explorative basis, a demographic profile template was constructed for this study as is shown in Appendix 4.

5.8   Operationalisation of research concepts used in this study

The theoretical constructs shown in Figure 4.1 is operationalised through the use of a psychometric measuring instrument developed by Bluedorn, *et al.,* (1998), referred to as Inventory of Polychronic Values (IPV). The IPV possess the attributes of a sound (valid and reliable) scale for measuring the polychronicity construct as a dimension of

organizational culture and is a key enabler of this empirical study. The IPV is discussed in more detail in Section 5.8. Hence, the constructs translate to the practical variables and hypotheses shown in Figure 5.1:

When the constructs shown in Figure 4.1, and the research propositions mentioned above, are operationalised, they translate into the following variables and hypotheses:

Figure 5.1:   *An overview of the relationships between the theoretical constructs and operational variables underlying the relationships between the IPV scale measurements of CRA's and management in a multinational pharmaceutical organization.*
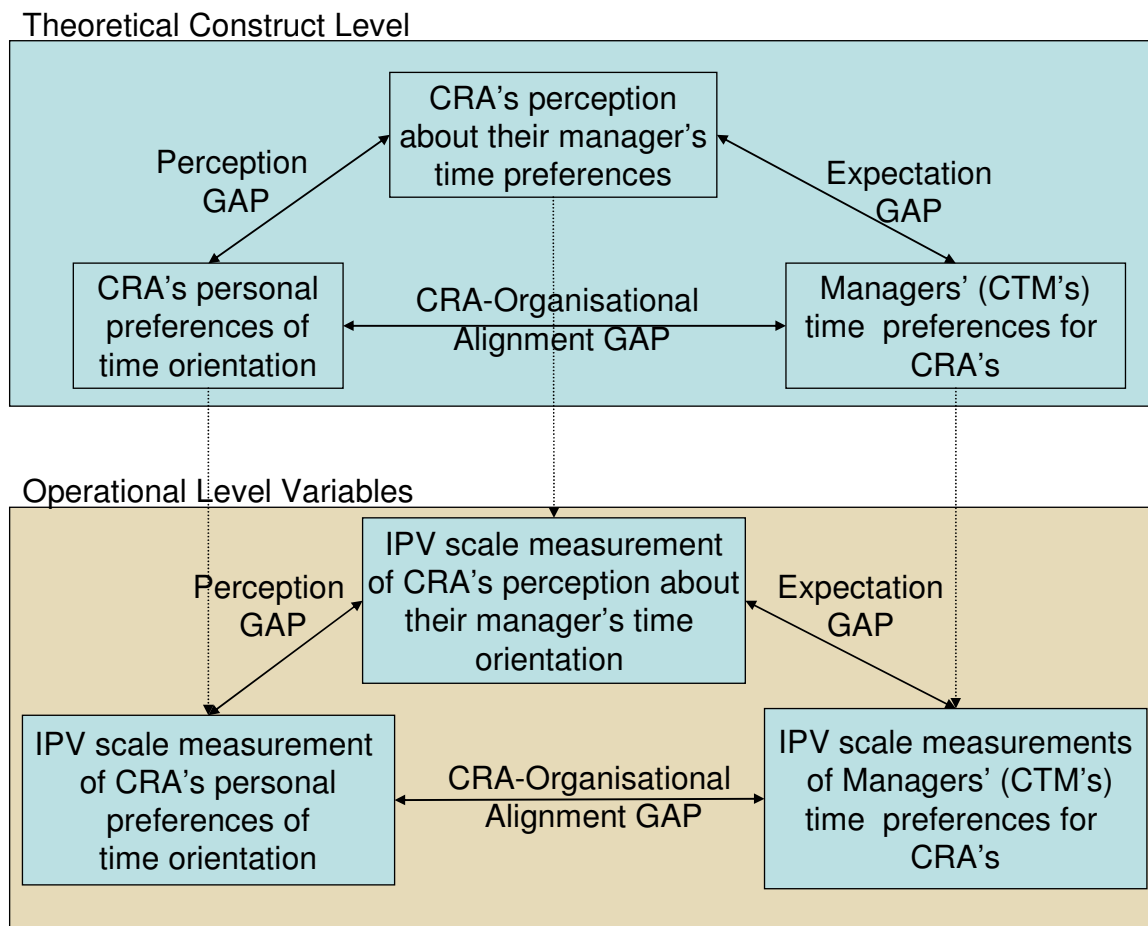
The following hypotheses are made (corresponding to the propositions above):

H1:   CRA's have different personal preferences for their own time orientation based on the IPV scale measurements

H2:   CRA's have different perceptions about their manager's time orientation expectation based on the IPV scale measurements

H3: Managers (CTM's and Lead CRA's) have different expectations for CRA's time orientation behaviour based on the IPV scale measurements

H4: CRA's personal preferences for their own time orientation is significantly different from what they perceive their manager's time orientation behaviour expectation to be, based on the IPV scale measurements

H5: CRA's personal preferences for their own time orientation is significantly different from the manager's (CTM's and Lead CRA's) expectations for time orientation behaviour, based on IPV scale measurements

H6: CRA's perceptions about their manager's time orientation behaviour expectation is significantly different from the manager's (CTM's) own expectations for time orientation, based on the IPV scale measurements

These hypotheses will be tested and the findings of the tests will be reconciled with the theoretical model shown in Figure 4.1.

5.9   Statistical Methods employed in this study

This study employed descriptive statistics to describe the nature of the research data set. Since hypotheses H1, H2 and H3 make statements about non-similarity or heterogeneity within groups and since the standard packaged statistical packages do not offer statistical tests for homogeneity/heterogeneity within a group, they were treated as statements and investigated by means of cross tabulation and confirmed by means of Chi-square testing for relatedness or independence. In this case the demographic variables were used as discriminatory factors in the cross tabulation.

Hypotheses H4 make a statement about differences between two CRA Opinion Groups. This implies a dependency in the sense that both Opinion Groups apply to the same set of respondents. Therefore hypotheses H4 were analysed using a paired T-test for dependent samples. Hypotheses H5 and H6 refer to differences between two independent groups and were therefore analysed using a T-test for independent samples.

Impact of demographic variables on the opinions of the respondents were analysed using one-way ANOVA for each of the three Opinion Groups shown in Figure 4.1.

The next chapter presents the data and the statistical perspectives associated with the viewpoints expressed in this study. Only those statistical tables and figures that have a direct bearing on the discussion and its conclusions are shown.

Chapter 6: Data Examination, Analysis and Testing

6.1 Introduction

This chapter deals with the first step of extracting meaning from the data collected in this research study. The data set was subjected to manipulation within the SPSS statistical software for Windows. SPSS (Statistical Package for Social Sciences) was initially developed in 1968 to support research in the Social Sciences (Huizingh, 2007). Today SPSS offers a very broad range of statistical methods. The SPSS package has become very user friendly, and since many present-day SPSS users are less familiar with the fundamentals of the assumptions, computational methods and interpretation frameworks underlying statistics, there is an inherent risk of incorrectly performing or interpreting analysis. SPSS offers little protection against this risk and therefore a good basic understanding of statistics remains a pre-requisite fro properly applying these techniques.

6.2 Cleaning the data set

The overall sample of respondents represents two groups namely CRA's (72 respondents) and Managers (including Lead CRA's and CTM's) (48 respondents). The overall data set on which this study is based consists of three opinion groups, two of which represent opinions by CRA's, and one which represents opinions by Managers. In all cases respondents indicated their opinion on a 7-point Likert scale about the ten statements posed by the Inventory of Polychronic Values (IPV) measuring instrument (Bluedorn, et al., 1999) as discussed in Appendix 3.

Demographic variables across the entire sample of respondents include Gender (male, female), Age (less than 20 years, less than 30 years, less than 40 years, less than 50 years, less than 60 years), Cultural Heritage (African, European, Asian, Indian, other) Nationality (RSA or other), Place of Origin (City, Town/Village, Rural) and Title (CRA or Manager). The total data set is characterised by the demographic profile shown in Figure 6.1:

Table 6.1: *Summary of demographic profile of the data set*

Demographic Variable		CRA's (66)	Managers (46)	Total (112)	Percentages (%)
Gender	*Male*	11	2	13	11.6
	Female	55	44	99	88.4
Age	*Equal or less than 20*	0	0	0	0
	Equal or less than 30	30	4	34	30.4
	Equal or less than 40	19	26	45	40.2
	Equal or less than 50	9	10	19	17.0
	Equal or less than 60	8	6	14	12.5
Cultural Heritage	*African (Black)*	10	4	14	12.5
	European (White)	46	38	84	75.0
	Asian (Far East)	0	0	0	0
	Indian	6	4	10	8.9
	Other	4	0	4	3.6
Nationality	*Rep. of South Africa*	64	44	108	96.4
	Other	2	2	4	3.6
Place of Origin	*City*	49	36	85	75.9
	Town/Village	16	10	26	23.2
	Rural	1	0	1	0.9

The first opinion group consists of CRA's personal preferences for time-use. The second opinion group consists of the perceptions of CRA's about the time-use behaviours that their managers expect from them. The third opinion group consists of managers' expectations of time-use behaviours for CRA's.

The two sets of CRA responses have six cases of corrupt data due to respondents indicating a manager position for their title. Likewise the set of Manager responses has two cases of corrupt data due to respondents indicating a CRA position for their title. These cases were omitted from further statistical analyses.

6.3   Testing for normality of frequency distributions

The cleaned-up data set consists of three opinion groups, namely CRA's preference for time use (66 data points), CRA's perceptions of what their respective Managers want from them (66 data points), and Managers' (including Lead CRA's and CTM's)

expectations of time-use for CRA's (46 data points). The average score of each respondent over the ten questions of the IPV questionnaire represents the relative polychronicity value for the respective respondent. The frequency tables for these average scores have been generated to confirm that the distributions are within acceptable limits of the normality requirement for further statistical analyses. All skewness and kurtosis statistics lie within a +0.5 and -0.6 range from 0 (the perfectly normally distributed data set), as is shown in Table 6.2 below.

Table 6.2: *Frequency Tables for the calculated average scores of respondents for each of the three opinion groups*

Statistics	CRA preference	CRA's perception of what manager wants	Managers expectation
N Valid	66	66	46
Missing	0	0	0
Mean	3.6285	4.5015	4.2761
Median	3.5500	4.4000	4.1500
Std. Deviation	1.07770	1.02184	1.00115
Variance	1.161	1.044	1.002
Skewness	.482	-.176	.023
Std. Error of Skewness	.295	.295	.350
Kurtosis	-.481	.094	-.599
Std. Error of Kurtosis	.582	.582	.688
Range	4.20	4.80	4.00
Minimum	1.80	1.80	2.10
Maximum	6.00	6.60	6.10

Table 6.2 also shows that the group mean for CRA's own preference of time-use (3.6285) is lower than the other two opinion groups (4.5015 and 4.2761 for "CRA's perception of what manager wants", and "Manager's preference" respectively), which mean that CRA's are more monochronic than the others. This will be investigated in more detail later in this chapter. Also, Table 6.2 shows that Managers' expectation for CRA's (4.2761) has a lower mean than CRA's perception of what managers want (4.5015), which mean that managers are less polychronic than what CRA's perceive them to be.

Visual inspection from the histograms shown in Figure 6.1 below shows reasonable correspondence to a normal distribution curve overlaid across the columns of the

histogram for CRA's preference, CRA's perception of what their managers want, and for managers' expectation for the CRA's, respectively.

From the skewness and kurtosis statistics, as well as the visual inspection of the histograms, the data set for the three opinion groups is considered to be within the useful limits of a normal distribution and the statistical analyses, underlying by T-tests and F-tests, can proceed reliably.

Figure 6.1: *Histograms for each of the three opinion groups showing a normal distribution curve shaped across the histogram columns to facilitate easy visual comparison.*

51
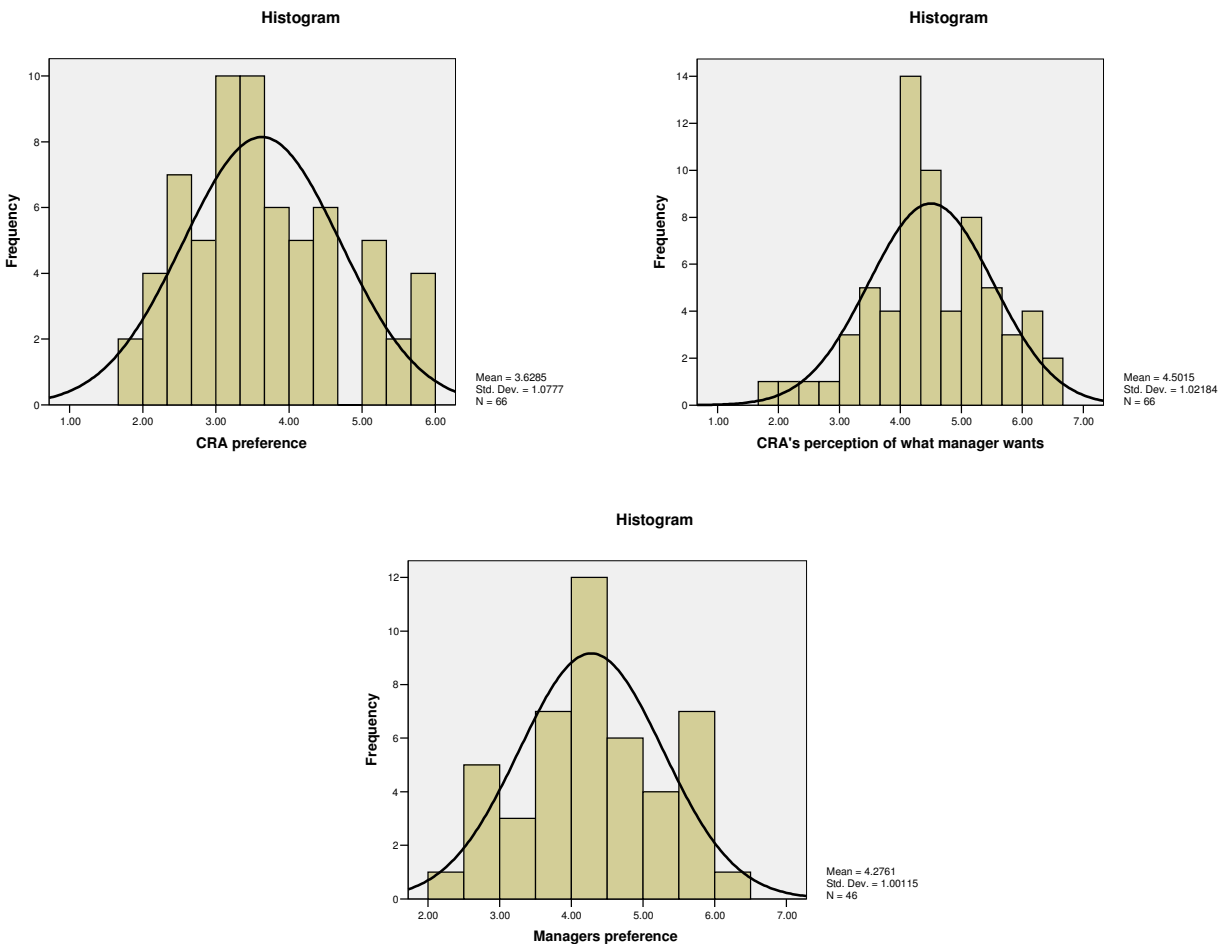
6.4   Distribution profile of item-level responses

Table 6.3: *Distribution profile of responses in terms of average scores of the three opinion groups for each of the statements addressed in the IPV questionnaire. The average score for an item indicates the relative polychronicity value of the respondent group for that item or question.*

Sample Group	Opinion Group	Statement number	N	Minimum	Maximum	Mean	Std. Deviation
CRA's	CRA's personal preference of time-use behaviour	item 1	66	1	7	4.62	1.586
		item 2	66	1	7	3.17	1.997
		item 3	66	1	7	3.59	1.691
		item 4	66	1	7	3.33	1.924
		item 5	66	1	7	2.89	1.746
		item 6	66	1	7	4.12	1.877
		item 7	66	1	7	2.67	1.739
		item 8	66	1	7	4.35	1.705
		item 9	66	1	7	3.71	1.717
		item 10	66	1	7	3.83	1.894
		ave_section_1	66	2	6	3.63	1.078
	CRA's perceptions about what time-use behaviour their managers expect from CRA's	item 11	66	1	7	5.20	1.657
		item 12	66	1	7	4.61	1.762
		item 13	66	1	7	4.70	1.736
		item 14	66	1	7	4.50	1.748
		item 15	66	1	7	4.39	1.952
		item 16	66	1	7	4.24	1.560
		item 17	66	1	7	3.80	1.756
		item 18	66	1	7	4.70	1.467
		item 19	66	1	7	4.29	1.821
		item 20	66	1	7	4.59	1.664
		ave_section_2	66	1.80	6.60	4.50	1.021
Managers	Managers' expectation of time-use behaviour for CRA's	item21	46	1	7	5.67	1.564
		item22	46	1	7	4.20	1.905
		item23	46	1	7	3.67	1.739
		item24	46	1	7	4.57	1.858
		item25	46	1	7	3.72	1.747
		item26	46	1	7	4.04	1.563
		item27	46	1	7	3.39	1.903
		item28	46	1	6	4.35	1.552
		item29	46	2	7	4.74	1.527
		item 30	46	1	7	4.41	1.808
		ave_section _3	46	2.10	6.10	4.27	1.001

Table 6.3 shows that for each opinion group the range of values lie between statement 1 (Item1, 11 and 21) and statement 7 (Item 7, 17 and 27). Statement 1 states "I/my manager/CRA's like to juggle several activities at the same time" and statement 7 asks "I/my manager/CRA's believe it is best to complete one task before beginning another". Statement 7 is a reverse scored item and hence the average score represents an affirmative response. These two items solicit the strongest opinion from respondents. In both cases the response supports the statement made in the IPV Measuring Tool. The average scores in each opinion group lies within a relatively narrow band around the mean, with CRA's showing less polychronicity than Managers. At the same time Managers show less polychronicity that what the CRA's perceive them to be. These relationships will be investigated in the following sections.

6.5 Testing for difference of the means between the two CRA opinion groups

The CRA opinion groups in Table 6.2 and Table 6.3 show different means. In order to confirm that these group means are significantly different and hence that the two opinion groups are different, the CRA opinion group scores have been subjected to a paired T-test for dependent samples. The T-test tests the two groups for the null hypothesis that the two group means are equal (Huizingh, 2007). The T-value is computed based on the variances within the two groups. There are two ways of interpreting the significance level, namely a one-tailed and a two-tailed significance level. Which one is used depends on the way in which the alternative hypothesis is stated (Huizingh, 2007). If the alternative hypothesis states that the mean in one group is higher than in the other, a one-way testing is used. On the other hand, if the alternative hypothesis simply states that the means of two groups differ, without stating in which direction, a two-tailed test is used. The following statistical evidence was obtained:

Table 6.4: *Paired sample correlations*

		N	Correlation	Sig.
Pair 1	item 1 & item 11	66	.222	.073
Pair 1	item 2 & item 12	66	.176	.157
Pair 1	item 3 & item 13	66	.329	.007
Pair 1	item 4 & item 14	66	.261	.034
Pair 1	item 4 & item 14	66	.261	.034
Pair 1	item 5 & item 15	66	.164	.187
Pair 1	item 6 & item 16	66	.232	.061
Pair 1	item 7 & item 17	66	.437	.000
Pair 1	item 8 & item 18	66	.147	.238
Pair 1	item 9 & item 19	66	.184	.138
Pair 1	item 10 & item 20	66	.115	.359
Pair 1	ave_section_1 & ave_section_2	66	.167	.179

The correlation coefficients shown in Table 6.4 are generally weak with four of the ten item pairs showing significance levels below 0.05. To the extent that correlations are close to zero, the paired T-tests could have been replaced by a T-test for independent samples. But it will not affect the outcome of the T-tests shown in Table 6.5 significantly.

Table 6.5: *Paired samples tests*

		Paired Differences						t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			Mean	Std. Deviation	Std. Error Mean
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	
Pair 1	item 1 - item 11	-.576	2.023	.249	-1.073	-.078	-2.312	65	.024	
Pair 1	item 2 - item 12	-1.439	2.419	.298	-2.034	-.845	-4.835	65	.000	
Pair 1	item 3 - item 13	-1.106	1.986	.244	-1.594	-.618	-4.526	65	.000	
Pair 1	item 4 - item 14	-1.167	2.237	.275	-1.717	-.617	-4.238	65	.000	

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		Mean	Std. Deviation	Std. Error Mean
	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
Pair 1 item 5 - item 15	-1.503	2.396	.295	-2.092	-.914	-5.096	65	.000
Pair 1 item 6 - item 16	-.121	2.145	.264	-.648	.406	-.459	65	*.648
Pair 1 item 7 - item 17	-1.136	1.855	.228	-1.592	-.680	-4.976	65	.000
Pair 1 item 8 - item 18	-.348	2.079	.256	-.860	.163	-1.362	65	*.178
Pair 1 item 9 - item 19	-.576	2.260	.278	-1.131	-.020	-2.069	65	.042
Pair 1 item 10 - item 20	-.758	2.373	.292	-1.341	-.174	-2.593	65	.012
Pair 1 ave_section_1 - ave_section_2	-.873	1.355	.166	-1.206	-.539	-5.233	65	.000

Using a confidence level of 0.05 it can be seen from the paired average values that the significance level is 0.000, and hence it is clear that the null hypothesis of equal means for the two CRA opinion groups should be rejected. However, items 6/16 and 8/18 show a significance level of *0.648 and *0.178 respectively. For these two items therefore the null hypothesis can not be rejected and hence their mean values are considered to be the same for both CRA opinion groups. This also means that the CRA's personal preference coincides with what they perceive their managers want from them on these two items.

An independent sample T-test was performed for the opinion groups "CRA's own preferences for time-use behaviour", and "Managers' expectations for CRA time-use behaviour". Using Title (CRA or Manager) as the discriminating factor, the group means were shown to be different with a significance level of 0.001.

6.6 Distinguishing between the groups based on demographic variables

Using one variable at a time, the three groups were analysed against the demographic variables to gain an understanding of the ability of a demographic variable to create a distinction between the groups. One-way ANOVA analysis was done for Age and Cultural Heritage as demographic variables. The statistical output of this analysis is shown in Appendix 5.

The Gender and Nationality both had only one subgroup of significant size, as is shown in Table 6.1, and hence do not have the ability to be significantly associated with differences between the CRA opinion groups. In the case of Place of Origin no significant difference was found between respondents from a city and respondents from a town/village. Age sub-groups were consolidated into three to render all sub-groups significant in terms of number of respondents, namely equal or less than 30, equal or less than 40 and equal or less than 60. Likewise, the Cultural Heritage sub-groups were consolidated into European and the rest combined into African and Indian. ANOVA also analyse the null hypothesis that the means of all groups are equal.

In the case of Age as a demographic factor, the opinion groups of "CRA's perception of what their managers want", and the "Managers' expectation for their CRA's", shown F-values with significance levels of more than 0.05 and hence the notion of the means of these groups being equal cannot be rejected. Therefore, Age as a factor can not be associated with group mean differences for these two groups. In the case of the opinion group dealing with "CRA's own preference towards time-use", the significance level of the F-test is 0.049, which indicates a possible group difference association. However, inspection of the item level F-values for this group indicates significance levels above an Alpha value of 0.05, except for item 10, which shows a significance level of 0.014. This single value could be responsible for the marginal group level significance level of 0.049. In this situation it is safer to assume that this opinion group also does not have the statistical power to reject the null hypothesis and therefore Age can not be associated with any opinion group differences.

In the case of Cultural Heritage the opinion group of "CRA's perceptions about the time-use behaviours that their managers want" is associated with differences between Europeans (white) and the combination of Africans (Black) and Indians. This group

average F-test is supported by a 0.010 level of significance and hence the null hypothesis can be rejected. No association has been found for Cultural Heritage as a factor and "Managers' expectations for CRA's time-use behaviours" and "CRA's own preferences for time-use behaviours".

6.7   Cross Tabulation of Contrast Groups for each of the three Opinion Groups

In order to further investigate the extent of the differences within each of the three Opinion Groups, contrast sub-groups were identified. For each Opinion Group two contrast groups were defined; namely all average item scores below 3.5 was consolidated under subgroup 1, and all average item scores above 4.5 under subgroup 2. Scores between 3.5 and 4.5 were ignored. The following cross tabulation summaries were obtained by comparing the Opinion Group responses against the demographic variables of Cultural Heritage (Table 6.6), Age (Table 6.7) and Gender (Table 6.8). Two contrast groups were defined namely all average item scores below 3.5 was consolidated under subgroup 1 and all average item scores above 4.5 under subgroup2. Each Cross Table shows the percentage of the contrast group that falls inside the demographic sub-group.

Table 6.6: *Cross tabulation of the three Opinion Groups against Cultural Heritage*

			Opinion Group 1		Total
			1.00	2.00	1.00
Cultural Heritage	**African and Asian**	Count	10	1	11
		% within contrast groups	31.3%	8.3%	25.0%
	European	Count	22	11	33
		% within contrast groups	68.8%	91.7%	75.0%
Total		Count	32	12	44
		% within contrast groups	100.0%	100.0%	100.0%

| | | | Opinion Group 2 | | Total |
			1.00	2.00	1.00
Cultural Heritage	**African and Asian**	**Count**	6	4	10
		% within contrast groups	60.0%	12.9%	24.4%
	European	**Count**	4	27	31
		% within contrast groups	40.0%	87.1%	75.6%
Total		**Count**	10	31	41
		% within contrast groups	100.0%	100.0%	100.0%

| | | | Opinion Group 3 | | Total |
			1.00	2.00	1.00
Cultural Heritage	**African and Asian**	**Count**	2	4	6
		% within contrast groups	16.7%	22.2%	20.0%
	European	**Count**	10	14	24
		% within contrast groups	83.3%	77.8%	80.0%
Total		**Count**	12	18	30
		% within contrast groups	100.0%	100.0%	100.0%

Table 6.7: *Cross tabulation of the three Opinion Groups against Age.*

| | | | Opinion Group 1 | | Total |
			1.00	2.00	1.00
Age	**2.00**	**Count**	12	8	20
		% within contrast groups	36.4%	57.1%	42.6%
	3.00	**Count**	10	5	15
		% within contrast groups	30.3%	35.7%	31.9%
	4.00	**Count**	11	1	12
		% within contrast groups	33.3%	7.1%	25.5%
Total		**Count**	33	14	47
		% within contrast groups	100.0%	100.0%	100.0%

| | | | Opinion Group 2 | | Total |
			1.00	2.00	1.00
Age	2.00	Count	6	10	16
		% within contrast groups	60.0%	31.3%	38.1%
	3.00	Count	0	11	11
		% within contrast groups	.0%	34.4%	26.2%
	4.00	Count	4	11	15
		% within contrast groups	40.0%	34.4%	35.7%
Total		Count	10	32	42
		% within contrast groups	100.0%	100.0%	100.0%

| | | | Opinion Group 3 | | Total |
			1.00	2.00	1.00
Age	2.00	Count	1	2	3
		% within contrast groups	8.3%	11.1%	10.0%
	3.00	Count	6	10	16
		% within contrast groups	50.0%	55.6%	53.3%
	4.00	Count	5	6	11
		% within contrast groups	41.7%	33.3%	36.7%
Total		Count	12	18	30
		% within contrast groups	100.0%	100.0%	100.0%

Table 6.8: *Cross tabulation of the three Opinion Groups against Gender.*

| | | | Opinion Group 1 | | Total |
			1.00	2.00	1.00
Gender	1	Count	3	2	5
		% within contrast groups	9.1%	14.3%	10.6%
	2	Count	30	12	42
		% within contrast groups	90.9%	85.7%	89.4%
Total		Count	33	14	47
		% within contrast groups	100.0%	100.0%	100.0%

			Opinion Group 2		Total
			1.00	2.00	1.00
Gender	1	Count	2	4	6
		% within contrast groups	20.0%	12.5%	14.3%
	2	Count	8	28	36
		% within contrast groups	80.0%	87.5%	85.7%
Total		Count	10	32	42
		% within contrast groups	100.0%	100.0%	100.0%

			Opinion Group 3		Total
			1.00	2.00	1.00
Gender	1	Count	0	2	2
		% within contrast groups	.0%	11.1%	6.7%
	2	Count	12	16	28
		% within contrast groups	100.0%	88.9%	93.3%
Total		Count	12	18	30
		% within contrast groups	100.0%	100.0%	100.0%

Each of the above Contrast Group Cross Tabulations shows differences in the Opinion Group when tabulated against the Demographic Variable. These differences may serve to indicate that the Opinion Groups are not similar. These subgroup differences were tested with a Chi-square test for relatedness or independence. One of the assumptions of the Chi-square test is that of Size of Expected Frequencies (Coakes and Steed, 2007). When the number of cells is less than10, and particularly when the total sample size is small, the lowest expected frequency required for a Chi-square test is five. However, the observed frequencies can be any value, including zero. In the Chi-square analysis results shown in Table 6.9 below it can be seen that the minimum expected cell frequencies (count) is less than 5. This is a violation of the assumption about Size of Expected Frequencies and hence the contents of Table 6.9 should be used with caution. Table 6.9 shows a significance level of more than 0.05 in almost all cases. Hence the null hypothesis that there are no relationships between the two variables can not be rejected. The exception on this rule is the situation at Cultural Heritage against Opinion Group 2, namely "CRA's perceptions of what time-use behaviours are expected by the Managers". In this case a Chi-square significance level of 0.003 is obtained. Given the

small sample size and the assumption violation as discussed, this exception should not be taken as a significant indicator of a possible trend.

Table 6.9: *Chi-square tests for the Cross Tabulation.*

Chi-square Tests				
Opinion Group	**Demographic Factor**	**Minimum expected count**	**Pearson Chi-square Value**	**Asymp. Sig. (2-sided)**
1	Cultural Heritage	3.0	2.444	0.118
	Age	3.57	3.728	0.155
	Gender	1.49	0.279	0.597
2	Cultural Heritage	2.44	9.094	0.003
	Age	2.62	5.158	0.076
	Gender	1.43	0.350	0.554
3	Cultural Heritage	2.40	0.139	0.709
	Age	1.20	0.234	0.890
	Gender	0.80	1.429	0.232

6.8 Analysis of the GAPS between Opinion Groups

Table 6.10: *Summary view of Gaps between the two CRA Opinion Groups*

GAP	Gap Item	N	Abs[Mean]
Perception Gap	Gap5_absolute	66	2.1636
	Gap2_absolute	66	2.1061
	Gap4_absolute	66	1.8333
	Gap10_absolute	66	1.8182
	Gap9_absolute	66	1.6667
	Gap3_absolute	66	1.6212
	Gap1_absolute	66	1.6061
	Gap6_absolute	66	1.5758
	Gap7_absolute	66	1.5606
	Gap8_absolute	66	1.4697
	Gap_absolute_1	66	1.2064

GAP	Gap Item	N	Abs[Mean]
Organisational Alignment Gap	**Gap21_01_absolute**	48	1.0530
	Gap22_02_absolute	48	1.0290
	Gap23_03_absolute	48	0.0830
	Gap24_04_absolute	48	1.2320
	Gap25_05_absolute	48	0.8260
	Gap26_06_absolute	48	0.0780
	Gap27_07_absolute	48	0.7250
	Gap28_08_absolute	48	0.0000
	Gap29_09_absolute	48	1.0270
	Gap30_10_absolute	48	0.5797
	Gap_absolute_2	48	0.6476
Expectation Gap	**Gap21_11_absolute**	48	0.4769
	Gap22_12_absolute	48	0.4104
	Gap23_13_absolute	48	1.0231
	Gap24_14_absolute	48	0.0652
	Gap25_15_absolute	48	0.6765
	Gap26_16_absolute	48	0.1989
	Gap27_17_absolute	48	0.4117
	Gap28_18_absolute	48	0.3491
	Gap29_19_absolute	48	0.4513
	Gap30_20_absolute	48	0.1800
	Gap_absolute_3	48	0.2300

The Gaps between the Opinion Groups is of interest since it indicates a measure of behavioural difference between groups with respect to time-use. These Gaps are shown as the three lines that link-up the three groups shown in Figure 4.1. For the two CRA Opinion Groups the Gap is defined as Perception Gap, the absolute value of the difference between each score in the "CRA's own preferred time-use behaviour"-group and the corresponding score in the "CRA's perception of their Managers time-use expectation for CRA's", as well as the absolute value of the difference between the two group averages.

Likewise, there are two Gaps defined around the Managers Opinion Group. One is defined as Organisational Alignment Gap, the absolute value of the difference between each score in the "Managers expectation for CRA time-use behaviour" and the "CRA's own preference for time-use behaviour", as well as the absolute value of the difference between the two group averages. The other one is defined as Expectation Gap, the

absolute value of the difference between each score in the "Managers expectation for CRA time-use behaviour" and the "CRA's perception of the time-use behaviours their Managers' want them to have", as well as the absolute value of the difference between the two group averages.

The values of these three Gaps are represented by the average values shown in Table 6. 10 as Gap_absolute_1, Gap_absolute_2 and Gap_absolute_3.

6.9   Testing for the significance of Opinion Group 3 group relationships

This section analyses the extent to which CRA's and Managers are in alignment and therefore tests the significance of the relationship between Opinion Groups 1 and 3 and between Opinion Groups 2 and 3. This section uses the T-test for independent samples and analyses the null hypothesis that the two means are equal for each of the combinations of groups 1 and 3 (Table 6.11), and 2 and 3 (Table 6.12).

The interpretation of the independent T-test will differ depending on whether the variances in the two groups are equal or not (Huizingh, 2007). This assumption is tested in the T-test procedure by means of the Levene Test. The null hypothesis of the Levene test is that the variances of the two populations are equal. This test computes the difference between each case and the group mean and then performs an analysis of the variance on the differences.   The result is then shown as an F-value with a corresponding significance level. A significance level lower that 0.05 leads to the rejection of the null hypothesis of equal variances. If this is the case, then the corresponding T-test will be one where equal variances are not assumed. In Tables 6.11 and 6.12 the outcomes of the Levene test are shown in the second column from the left. Following that are alternative T-tests for independent samples, corresponding to equal variances assumed or not.

In Table 6.11 Levene's test shown significance levels above 0.05 for all cases. Hence the T-test to apply in all cases in Table 6.11 is the "equal variances assumed"-situation.

Table 6.11: *Independent T-test for difference of means between Opinion Group 1 and 3*

		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	Lower	Upper	Lower	Upper	Lower	Upper	Lower
item 1	Equal variances assumed	.651	.422	-3.475	110	.001	-1.053	.303	-1.653	-.452
	Equal variances not assumed			-3.484	97.825	.001	-1.053	.302	-1.652	-.453
item 2	Equal variances assumed	.359	.551	2.383	110	.019	.899	.377	.151	1.646
	Equal variances not assumed			2.401	99.528	.018	.899	.374	.156	1.641
item 3	Equal variances assumed	.080	.778	-.253	110	.801	-.083	.329	-.734	.568
	Equal variances not assumed			-.251	95.234	.802	-.083	.330	-.739	.573
item 4	Equal variances assumed	.373	.542	3.380	110	.001	1.232	.364	.510	1.954
	Equal variances not assumed			3.402	99.098	.001	1.232	.362	.513	1.950
item 5	Equal variances assumed	.016	.899	2.441	109	.016	.825	.338	.155	1.495
	Equal variances not assumed			2.444	97.497	.016	.825	.338	.155	1.495
item 6	Equal variances assumed	3.598	.060	.231	110	.818	.078	.337	-.590	.746
	Equal variances not assumed			.238	106.468	.812	.078	.326	-.569	.725

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
item 7	Equal variances assumed	1.299	.257	2.087	110	.039	.725	.347	.036	1.413
	Equal variances not assumed			2.053	91.248	.043	.725	.353	.024	1.426
item 8	Equal variances assumed	.533	.467	.002	110	.998	.001	.316	-.625	.627
	Equal variances not assumed			.002	102.383	.998	.001	.311	-.615	.617
item 9	Equal variances assumed	3.143	.079	3.104	110	.002	.997	.321	.360	1.633
	Equal variances not assumed			3.186	104.898	.002	.997	.313	.376	1.617
item 10	Equal variances assumed	.308	.580	-1.623	110	.107	-.580	.357	-1.287	.128
	Equal variances not assumed			-1.637	99.748	.105	-.580	.354	-1.282	.123
ave_section_1	Equal variances assumed	3.179	.077	2.355	110	.020	.303	.129	.048	.559
	Equal variances not assumed			2.441	107.217	.016	.303	.124	.057	.550

Table 6.12: *Independent T-test for difference of means between Opinion Group 2 and 3*

		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	Lower	Upper	Lower	Upper	Lower	Upper	Lower
item 11	Equal variances assumed	1.500	.223	-1.533	110	.128	-.477	.311	-1.093	.140
	Equal variances not assumed			-1.549	100.393	.124	-.477	.308	-1.088	.134
item 12	Equal variances assumed	.795	.374	-1.543	110	.126	-.541	.351	-1.236	.154
	Equal variances not assumed			-1.520	91.711	.132	-.541	.356	-1.248	.166
item 13	Equal variances assumed	.024	.876	3.066	110	.003	1.023	.334	.362	1.684
	Equal variances not assumed			3.065	96.870	.003	1.023	.334	.361	1.686
item 14	Equal variances assumed	.146	.703	.189	110	.850	.065	.344	-.617	.748
	Equal variances not assumed			.187	93.105	.852	.065	.348	-.626	.757
item 15	Equal variances assumed	1.128	.290	-2.150	110	.034	-.767	.357	-1.475	-.060
	Equal variances not assumed			-2.189	102.723	.031	-.767	.351	-1.463	-.072
item 16	Equal variances assumed	.019	.890	.664	110	.508	.199	.300	-.395	.793
	Equal variances not assumed			.663	96.849	.509	.199	.300	-.396	.794

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
item 17	Equal variances assumed	1.035	.311	-1.179	110	.241	-.412	.349	-1.104	.280
	Equal variances not assumed			-1.162	91.864	.248	-.412	.354	-1.115	.292
item 18	Equal variances assumed	.662	.418	1.210	110	.229	.349	.289	-.223	.921
	Equal variances not assumed			1.198	93.415	.234	.349	.292	-.230	.928
item 19	Equal variances assumed	3.246	.074	1.377	110	.171	.451	.328	-.198	1.101
	Equal variances not assumed			1.421	106.200	.158	.451	.318	-.179	1.081
item 20	Equal variances assumed	.928	.337	.537	110	.592	.178	.331	-.479	.834
	Equal variances not assumed			.529	91.676	.598	.178	.336	-.490	.846
ave_section_2	Equal variances assumed	3.527	.063	.050	110	.961	.0069	.1382	-.2670	.2807
	Equal variances not assumed			.052	109.599	.958	.0069	.1311	-.2529	.2666

In Table 6.12 above, the significance for the Levene test is shown to be above 0.05 for all cases. Hence the null hypothesis of equal variances can not be rejected and the T-tests are performed on the "Equal variances assumed"-situation.

6.10 Reliabilities of Scale

The IPV scale has been extensively validated by its originators, Bluedorn, Kalliath, Strube & Martin (1999), against data that was obtained from 11 samples (N = 2,190) from bank employees, undergraduate students, hospital staff, dentists and their staffs, and state agency managers. Using test-retest reliability measurements they found the IPV scale to have a median Chronbach Alpha of 0.84. In this study the sample size is much smaller namely N = 112. A testing of the reliability of the IPV scale based on the sample size used in this study is shown in Table 6.13 below.

Chronbach Alpha statistics have been calculated for the use of the IPV scale on the "CRA's own personal time-use preferences"-group (CRA_Me), on the "CRA's perceptions of time-use behaviours their Managers want for them" –group (CRA_MyM), and the "Managers expectation of time-use behaviour for CRA's"-group (Manager_MyC). This is shown in Table 6.13. The alpha values displayed in Table 6.13 compares very favourably with that achieved by Bluedorn, et al., (1999), even though this study represents a much smaller sample size.

Table 6.13: *Chronbach Alpha statistics for the three incidents of the IPV scale used in this study*

Scale	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
CRA_Me	.804	.803	10
CRA_MyM	.797	.801	10
Manager_MyC	.782	.788	10

An item level analysis of scale reliability is shown in Table 6.14 below. In this case the lower values for the alpha is due to a small sample size and the technique of evaluating item level alpha on the basis of n -1 items for the n-dimensional scale. In spite of this, the alpha levels are still very high and consistent.

Table 6.14: *Item level Chronbach Alpha statistics for scale items for all three Opinion Groups*

Opinion group	Item No	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CRA_Me (1)	item 1	31.66	100.501	.413	.434	.794
	item 2	33.12	89.617	.596	.621	.772
	item 3	32.69	96.958	.490	.602	.786
	item 4	32.95	91.952	.555	.417	.777
	item 5	33.39	93.381	.584	.460	.775
	item 6	32.16	97.737	.401	.468	.796
	item 7	33.62	93.179	.594	.578	.774
	item 8	31.94	103.160	.291	.418	.807
	item 9	32.57	97.717	.456	.405	.789
	item 10	32.45	97.049	.416	.351	.794
CRA_MyM (2)	item 11	39.82	83.351	.606	.588	.764
	item 12	40.41	85.384	.489	.467	.777
	item 13	40.32	85.174	.506	.683	.775
	item 14	40.52	83.269	.567	.536	.768
	item 15	40.62	83.008	.495	.472	.777
	item 16	40.77	93.009	.298	.318	.798
	item 17	41.21	80.785	.651	.516	.757
	item 18	40.32	87.174	.551	.630	.772
	item 19	40.73	97.648	.096	.352	.824
	item 20	40.42	86.002	.507	.517	.776
Manager_MyC (3)	item21	37.09	92.126	.188	.433	.792
	item22	38.57	80.607	.468	.429	.761
	item23	39.09	83.814	.421	.287	.767
	item24	38.20	87.716	.260	.129	.789
	item25	39.04	83.954	.413	.413	.768
	item26	38.72	80.429	.619	.570	.744
	item27	39.37	84.149	.357	.165	.777
	item28	38.41	78.648	.696	.628	.735
	item29	38.02	82.288	.564	.499	.751
	item 30	38.35	77.787	.601	.658	.743

6.11 Interpretation of Statistical Results

The statistical tables shown in Chapter Six demonstrate the statistical power inherent to the sample data set. These statistical information need to be translated into practical statements about the sample and its implications for business and organisational processes. Chapter Seven serves to discuss the statistical information underlying this research study and to reach conclusion and recommendations.

Chapter 7: Discussion of Results, Recommendations and Conclusions

7.1 Introduction

The research sample was made up from professionals registered to the South African Clinical Research Association (SACRA). The sample included the titles of Clinical Research Associate (CRA), Lead CRA and Clinical Trial Manager (CTM). Although the research questionnaire did not ask for academic and/or professional qualifications, the sample is known to be mainly populated by graduates in the relevant sciences and applied sciences underlying the field of clinical trial implementation.

The respondents in the sample belonged to different cultural heritage groups, namely 75% European (White), 12.5% African (Black), 8.9% Indian, and 3.6% other. From an age perspective the demographic profile of the research sample is characterised by a rather mature age profile of 30.4% of respondents being 30 years or younger, 40.2% being 40 to 30 years of age and 29.5% being between 60 and 40 years of age. The sample group is dominated by women with an 88.4% female count for gender (11.6% male count). Furthermore, 96.4% of the respondents are South African citizens and 75.9% of them originate from a city environment. At a superficial level therefore the research sample consists mainly of Professional White South African Women, between 20 and 40 years of age, who come from a city background.

The South African Clinical Trial Industry is characterised by a strong presence of multi-national companies who staff professional positions in clinical trials mainly from the local labour force. The South African society is known to be "a complex amalgam of several cultures and subcultures". In addition, "the dominant management practices are, for historical reasons, Western". (Booysen, 2001b:32). Previous research (Norris, *et al*., 2005; Brislin and Kim, 2003; Morden, 1999; Hall and Hall, 1987) showed that people's value system about time-use varies significantly across the national, organisational and individual cultural landscape. According to Cotte and Ratneshwar (1999), the meaning of time-use will not be interpreted similarly by all individuals, but in accordance with each individual's life experience. This research study aims to investigate the extent to which

this diversity in life experience, particularly time-use behaviours, influences the perceptions and behaviours of professionals in the clinical trial industry.

7.2   The extent to which CRA's show polychronic behaviour

The main research problem in this study is to identify the extent to which CRA's, being project staff members on clinical trials, show polychronic behaviour, and how they align with the organisation in which they operate.

The data collected from the research sample through the Inventory of Polychronic Values measuring instrument has been organised into three Opinion Groups according to Table 6.3. Two of these deal with the opinions and perceptions of CRA's, namely the "CRA's personal preference of time-use behaviour" and "CRA's perceptions about what time-use behaviour their managers expect from CRA's". The third Opinion Group represents the opinion of Managers with respect to the time-use behaviour that is expected from CRA's. This Opinion Group represents the organisational expectation within which CRA's operate.

In order to address the main research problem of this study it is prudent to understand the hypotheses stated in Chapter 5.8. The diversity in the life experiences of the sample group, represented by the cultural dimensions of the respondents and to a limited degree by the demographic variables, is expected to effect differences in their time-use behaviours. The two Sample Groups present the CRA's as the active agents in executing work, and Managers as the moderators that create the environment in which CRA's operate. Any differences between these two groups will therefore constitute a potential misalignment between CRA's and the organisation. The two Opinion Groups within the CRA Sample Group represent a possible perception gap between the CRA's own preference for time-use behaviours and what they perceive their Managers expect from them. Any differences between these two Opinion Groups will therefore constitute a potential perception gap, which can also be seen as a potential source of stress. A third gap is defined, in terms of the theoretical model shown in Figure 4.1, by the potential difference in CRA's perceived time-use preference of Managers, and the Managers' own preferred expectations of time-use behaviours for CRA's. This misalignment would constitute an expectation gap.

Inspection of the histograms of Figure 6.1 shows that the simulated normal curve for CRA's own preference for time-use is positioned with its peak between polychronicity values of 3.00 and 4.00. Given the range of possible values from 1 to 7, 4 constitutes the scale-midpoint. Values greater than 4 indicate a more polychronic than monochronic behaviour and vice versa. Therefore CRA's appear to be relatively monochronic in the work behaviour towards time-use. Managers, on the other hand, show a normal peak at polychronicity values just higher than 4. Managers therefore appear to be relatively more polychronic than CRA's. The interesting aspect is that CRA's independently perceived managers to be more polychronic than themselves.

These observations can be cross-checked against the distribution of the mean values for the three Opinion Groups shown in Table 6.3. The range of CRA own choices stretch from 2.67 to 4.62 whilst the range of Managers expectations stretches from 3.39 to 5.67. The latter is in line with a perceived polychronicity of Managers by CRA's that stretches from 3.80 to 5.20. This range is also supporting the notion that different people have different time orientations (e.g. Norris *et al.*, 2005) and provides a basis for further investigation into the question of how this diversity impacts on the workplace.

7.2.1 Hypotheses H1, H2 and H3

These three hypotheses deal with the relative heterogeneity of each of the three Opinion Groups. These hypotheses state the following:

H1:   CRA's have different personal preferences for their own time orientation based on the IPV scale measurements

H2:   CRA's have different perceptions about their manager's time orientation expectation based on the IPV scale measurements

H3:   Managers (CTM's and Lead CRA's) have different expectations for CRA's time orientation behaviour based on the IPV scale measurements

A first step in understanding the dynamics of the research problem is therefore to confirm that CRA's and Managers have indeed different personal preferences for their own time-use behaviours. This confirmation was not done through a hypothesis testing procedure in the strict sense of the word since there is no standard packaged statistical procedure to prove that a group is similar or dissimilar in itself. Rather the researcher

created two contrast sub-groups within each Opinion Group, according to the procedure explained in Chapter 6.6, and generated cross tabulations against the demographic variables recorded for the research sample. In such a case the demographic variables act as discriminators of within-group differences. Therefore, from Tables 6.6, 6.7 and 6.8 it can be seen that there were differences of proportion between the contrast groups 1 and 2 for each Opinion Group, based on the respective demographic sub-group. A close inspection reveals that for Managers (Opinion Group 3) the differences of proportion between contrast groups 1 and 2 are less pronounced for each of the demographic variables. A possible explanation could lie in the relative age distribution of CRA's and Managers. Managers lie at the higher age distribution frequencies and represent a longer life experience cycle and hence the opinions of respondents are less polarized.

A useful observation from Table 6.1 is that the age distribution of Managers is displaced towards higher age, compared to that of CRA's, with a mode of 40 to 30 years of age (CRA's has a mode of 30 to 20 years of age). This distribution is shown in Figure 7.1.

Figure 7.1: *Age distribution frequency for CRA's and Managers*
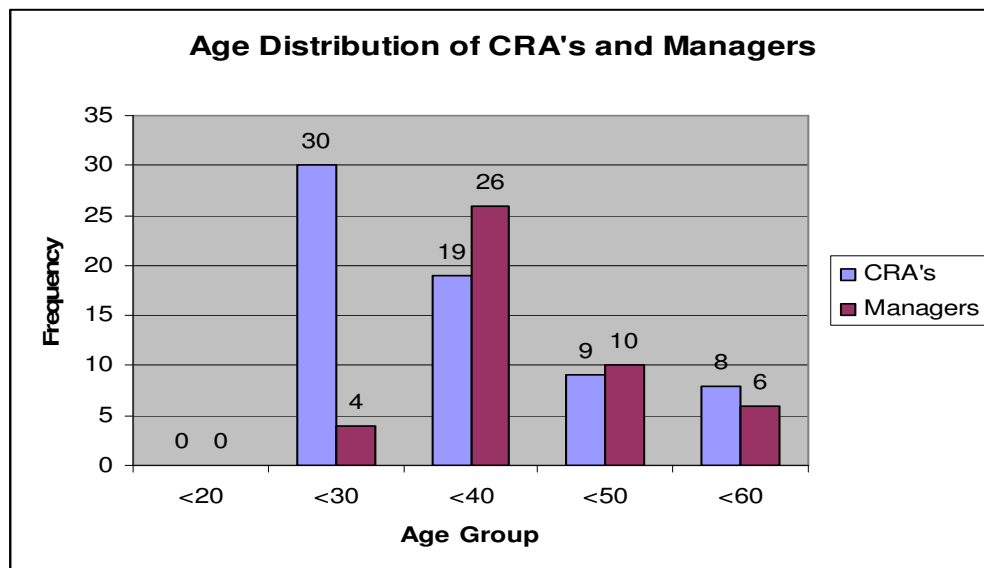
A possible explanation for the smaller differences in contrast groups amongst Managers could lie in the maturity of their life experiences. This phenomenon and its implications were not further investigated in this study.

The cross tabulations of Tables 6.6, 6.7 and 6.8 show the percentage of the contrast group that falls inside the demographic sub-group. To the extent that these percentages differ between contrast groups 1 and 2, the Opinion Group under focus has different preferences or perspectives towards time-use behaviour amongst its group members. These differences were also confirmed by means of a Chi-square test, (Table 6.9) except for the situation at Cultural Heritage against Opinion Group 2 (Table 6.6), namely "CRA's perceptions of what time-use behaviours are expected by the Managers". In this case the differences are inconclusive due to the small demographic sample size for "African and Asian" in Opinion Group 2 in Table 6.6 (6 counts in contrast group 1 and 4 counts in contrast group 2). The validity of the Chi-square test is under these circumstances is under suspicion and hence this case should be interpreted with care.

Given these arguments and the data shown in Tables 6.6, 6.7 and 6.8 the hypothesis stated as **H1, H2 and H3 were accepted as statements rather than hypotheses**. The implications for management become obvious if the statements in the IPV measurement tool are considered. Contrast group 1 represents a more monochronic behaviour (polychronicity score below 3.5) whilst contrast group 2 represents a more polychronic behaviour (polychronicity score above 4.5). Since the IPV scale is a 7 interval scale with very high scale reliability (Chronbach Alpha of better than 75% in this study) a difference of 1 scale interval is considered significant. Since this difference is more pronounced amongst CRA's than amongst Managers the challenge it represents is one of satisfying the diverse preferences of the CRA's, especially for Opinion Group 1 that represents CRA's own personal preferences for time-use behaviour.

7.2.2 Hypotheses H4, H5 and H6

Hypotheses H4, H5 and H6 address the question of differences, or similarity, between the three Opinion Groups. Hypothesis H4 is different in the sense that it addresses the relationship between two opinion groups that are both linked to the responses from the same CRA sample. Hypothesis H4 states that:

H4:   CRA's personal preferences for their own time orientation is significantly different from what they perceive their manager's time orientation behaviour expectation to be, based on the IPV scale measurements

Since the two CRA Opinion Groups are related in the sense that they represent two views by the same respondents, the assumption that the two group means are the same was tested by using a paired T-test (see Chapter 6.4). Table 6.5 shows that for the two CRA Opinion Groups as a whole, based on group averages, they are indeed significantly different. Hypothesis **H4 is therefore accepted** based on an alpha of 0.05 and a statistical significance level of 0.000. Table 6.2 shows that Opinion Group 1 has a polychronicity score 3.63 and Opinion Group 2 has a polychronicity score of 4.51. From a management perspective it is important to note that there are some points on which CRA's think they are exactly in synchronisation with what their managers expect, namely items 6/16 and 8/18 (see Table 6.5). Table 6.3 shows that in both cases their opinion lies between "neither agree nor disagree" to "slightly agree". It is important to note that the semantic scale has little management value on item level. It is simply a way to determine a polychronicity value for respondents based on all the statements of the IPV instrument. Hence, it can be used to indicate differences of opinion between groups, but not as an absolute opinion in itself.

Hypothesis H5 addresses the difference between Opinion Group 1 and Opinion Group 3 by stating that:

H5:   CRA's personal preferences for their own time orientation is significantly different from the manager's (CTM's and Lead CRA's) expectations for time orientation behaviour, based on IPV scale measurements

The independent T-test results shown in Table 6.11 for difference in group averages between Opinion Groups 1 and 3 (ave_section_1) shows a significance level of 0.02. Given a p-value of 0.05, the null hypothesis of equal means can be rejected and the **alternative hypothesis, H5, accepted**. However, a closer inspection of Table 6.11 at item level reveals that items 3, 6, 8 and 10 do support the "equal of means" – test. These items represent areas of agreement between CRA's and Managers with respect to the IPV statements as summarised in Table 7.1 below. From the averages for these items it can be seen that the opinions of both CRA's and Managers lean more towards polychronic behaviour that monochronic behaviour. It also indicates agreement between CRA's and Managers for the need of multi-tasking in the clinical trial environment.

Table 7.1: *IPV Statements associated with items 3, 5, 6, 8 and 10.*

Item No.	IPV Statement	Item Level Scores (from Table 6.3)		
		CRA	Man	Average
3	We believe people should try to do many things at once	3.59	3.67	3.63
6	We believe people do their best work when they have many tasks to complete	4.12	4.04	4.08
8	We believe it is best for people to be given several tasks and assignments to perform	4.35	4.35	4.35
10	We would rather complete parts of several projects every day than complete an entire project	3.83	4.41	4.12

Likewise, hypothesis H6 addresses the difference between Opinion Group 2 and Opinion Group 3 by stating that:

H6: CRA's perceptions about their manager's time orientation behaviour expectation is significantly different from the manager's (CTM's) own expectations for time orientation, based on the IPV scale measurements

The independent T-test results shown in Table 6.12 for difference in group averages between Opinion Groups 2 and 3 (ave_section_2) shows a significance level of 0.961. Given a p-value of 0.05, the null hypothesis of equal means can not be rejected and therefore the **alternative hypothesis, H6, needs to be rejected**. That means that CRA's perceptions (Opinion Group 2) about their manager's time orientation behaviour expectation is not significantly different from the manager's (CTM's, Opinion Group 2) own expectations for time orientation, based on the IPV scale measurements. In practical terms therefore the CRA's perceptions need to be seen as the same or similar to that of the Managers' expectations. The only exception at an item level of the responses is that item 5. Table 7.2 shows that CRA's perception differs from Managers' expectation on the issue of preference towards doing one thing at a time, Managers expecting CRA's to be more monochronic in this dimension.

Table 7.2: *IPV Statement associated with item 5.*

Item No.	IPV Statement	Item Level Scores (from Table 6.3)		
		CRA	Man	Difference
5	We prefer to do one thing at a time (R)	4.39	3.72	0.67

The rejection of H6 has an important impact on the theoretical model underlying this study as discussed in section 4.3. In order to test the difference between Opinion Groups 1 and 2 and between Opinion Groups 2 and 3 from a different perspective, one-sample T-tests were done against the value of the mean of Opinion Group 3 (4.27, from Table 6.3). Using the one-sample T-test in this way is only an approximation since the test value represents a sample-value, and not necessarily a population – value. This test is shown in Table 7.3 below.

Table 7.3: *One sample T- test for Opinion Group 1 against the value of the mean of opinion Group 3*

One-Sample Test

	Test Value = 4.27 (Opinion Group 3)					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
CRA preference (Opinion Group 1)	-4.836	65	.000	-.64152	-.9064	-.3766

At an alpha of 0.05 the significance value is 0.000 and hence the statement that the sample mean of Opinion Group 1 is equal to the value of the mean of the Opinion Group 3 is rejected and **H5 is accepted**. This result is in agreement with that of the independent T-test shown in Table 6.11.

Hypothesis H6 addresses the difference between Opinion Group 2 and Opinion Group 3. This test is shown in Table 7.4 below.

Table 7.4: *One sample T- test for Opinion Group 2 against the value of the mean of opinion Group 3*

One-Sample Test

	Test Value = 4.27 (Opinion Group 3)					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
CRA's perception of what manager wants (Opinion Group 2)	1.841	65	.070	.23152	-.0197	.4827

At an alpha of 0.05 the significance value is 0.070 and hence the statement that the sample mean of Opinion Group 1 is equal to the value of the mean of the Opinion Group 3 is accepted and **H6 is rejected**. This result is also in agreement with that of independent T-test shown in Table 6.12.

The rejection of hypothesis H6 is profound because it states that the CRA's perception of the time-use behaviour expected by their Managers is exactly that which the Managers themselves believe it should be. It therefore indicates a very good understanding on the side of CRA's as to what their managers expect from them in terms of time-use behaviour. It also means that the Expectation Gap, defined in Chapter 4.3, is not statistically significant and hence from a management perspective is considered to be zero. Therefore, the absolute gap size shown in Table 6.10, of 0.2300 is not statistically significant and the practical value of the variable Gap_absolute_3 is also set to zero.

7.3   *Relating the empirical results to the theoretical model*

The theoretical model defined in Figure 4.1 in Chapter 4.3 can be populated with the empirical results as is shown in Figure 7.2 below. It can be seen from this figure that the Expectation Gap, with an absolute value of 0.23, between CRA's perception about their Managers' time preferences, on the one hand, and the Managers' own expectations for the time-use of CRA's on the other, is not statistically significant. This Gap should therefore in practice be ignored and treated as "no gap". For that to happen it is

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necessary to collapse Opinion Group 2 and Opinion Group 3 into a single group. Such a collapsed model will only show two Opinion Groups namely CRA's own preferences and Managers' expectations. In line with the statistical interpretation of this study the model can therefore be simplified to that shown in Figure 7.3. The resulting single Gap now becomes more appropriately described as the CRA-Organisational Alignment or Time-use Behaviour Gap. This conclusion means that in the research sample under investigation CRA's are less polychronic (more monochronic) than managers.

Figure 7.2: *The theoretical model underlying this study overlaid with the empirical data*
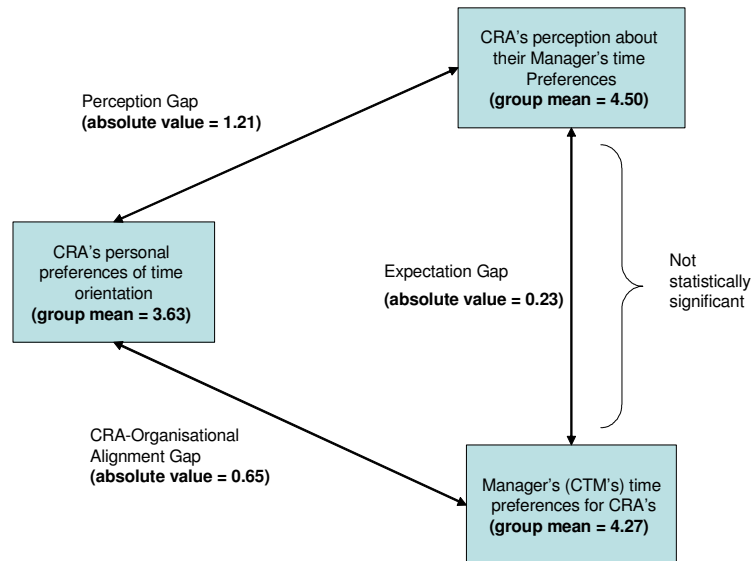
Figure 7.3: *Adapted theoretical model underlying this study overlaid with the empirical data*
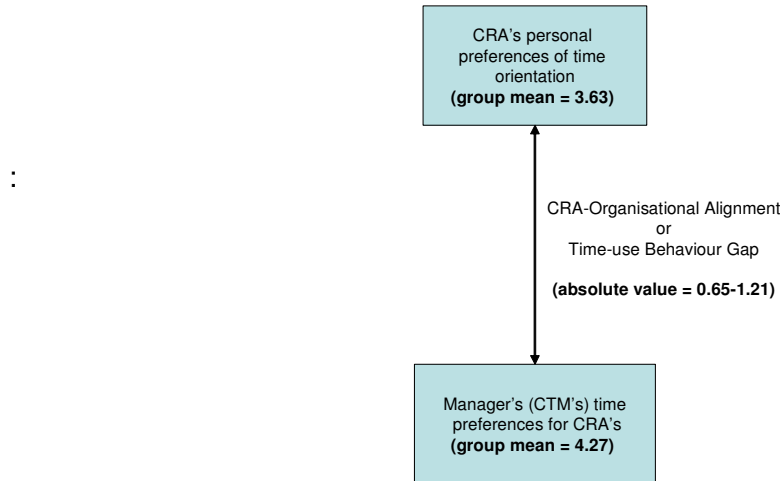
Figure 7.3 represents the most succinct way in which to represent the current knowledge about the polychronic behaviours of CRA's and Managers. With the Expectation Gap now off the table, it follows logically that the other two Gaps must be the same thing. Hence the consolidation of these two Gaps into a single Gap in Figure 7.3 defines the theoretical framework within which to make statistically significant conclusions and recommendations in this study.

7.4   Influence of Demographic Variables

The results from ANOVA analysis indicated very limited ability of demographic variables to influence the polychronicity scores of respondents. Gender and Nationality both had only one subgroup of significant size, as is shown in Table 6.1, and hence do not have the ability to be significantly associated with differences between the three opinion groups. In the case of Place of Origin no significant difference was found between respondents from a city and respondents from a town/village.

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The analysis of the impact of Age as a factor on the Opinion Groups is shown in Appendix 5. The only item level influence of significance occurred in item 10 for Opinion Group 1. The statement in the IPV instrument is, "I would rather complete parts of several projects every day than complete an entire project". Inspection of the descriptive table for the ANOVA (not shown in Appendix 5) indicated a mean score per item of 4.13, 4.37 and 2.71 for the age groups 2, 3 and 4 respectively. So, age group 4 (between 40 and 60 years of age) is significantly more monochronic than the others.

Cultural Heritage is shown to influence differences in Opinion Group 1 for item 3. The corresponding IPV statement is, "I believe people should try to do many things at once." Inspection of the descriptive table for the ANOVA (not shown in Appendix 5) indicated a mean score per item of 2.75 and 3.78 for the combination of African and Indian, on the one hand, and European respectively. It means that the European Cultural Heritage provides significantly more support for this IPV statement than their African and Indian counterparts.

More practical value is derived by considering the analysis of influence of the demographic variables on the respective Opinion Groups from the Cross Tabulation of Contrast Groups shown in Tables 6.6, 6.7 and 6.8. The Cross Tables show the percentage of the contrast group that falls inside the demographic sub-group. Two contrast groups were defined. All average item scores below 3.5 was consolidated under subgroup 1, and all average item scores above 4.5 under subgroup 2. In Table 6.5 for Opinion Group 1, for example, Cultural Heritage is associated with 31% of subgroup 1 being African and Indian, and 69% of subgroup 1 being European. At the same time 8% of subgroup 2 consists of African and Indian Cultural Heritage and 92% of subgroup 2 consists of European Cultural Heritage. Looking at Table 6.6 horisontally, 10 African and Indian respondents lie in subgroup 1 and only one respondent in subgroup 2. Likewise, 22 European respondents were in subgroup 1 and 11 European respondents were in subgroup 2. Looking at the data this way therefore provides a much clearer understanding of how the Cultural Heritage variable is influencing the demographic distribution in the Opinion Group. In contrast, for Opinion Group 3 (the Managers expectations), the larger number of respondents for both African and Indian, as well as European cultural heritage, occurs in subgroup 2 of the scale. Although, the differences in Opinion Group 3 between subgroup 1 and subgroup 2 are much smaller than that in Opinion Group 1. This was argued to be ascribed to the higher age (and life experience) maturity of Opinion Group 3.

7.5　Reflection on the results of this study

Time research in literature can be classified into different levels of complexity (Ofori-Dankwa and Julian, 2001). Higher levels of complexity of theoretical models enable researchers to explain higher levels of observed behavioural complexity.

7.5.1　Levels of complexity in time-use behaviour

At a simple level in this hierarchy polychronicity refers to the tendency of people to do many things at the same time, or within the same time-span (Bluedorn, *et al.*, 1999). The general view is that individuals, groups and organisations have one dominant mode of operation that can be located at some point along a monochronic-polychronic continuum (Kaufman-Scarborough, *et al.*, 1999).

At a higher level of complexity time orientation is linked to organisational life and time cycles (Ofori-Dankwa, *et al.*, 2001). It is assumed that an entity can alter its polychronicity preferences over time. For example, Schein (1985) suggests that young organisations should be polychronic, whereas large and mature organisations require highly coordinated activities and should be monochronic.

At a next level of complexity multiple time orientations exist at once (Ofori-Dankwa, *et al.*, 2001). This statement is supported by the arguments put forward for management to confine batches of hours to particular tasks and develop a sensitivity for multiple temporalities and different time arrangements within an organisation (Karsten and Leopold, 2003). Focusing on personal variations in time perspectives, Zimbardo and Boyd (1999:1285) defined a balanced time perspective as one where "balance is defined as the mental ability to switch flexibly among time perspectives depending on task features, situational considerations, and personal resources rather than be biased towards a specific time perspective that is not adaptive across situations".

Finally, at the highest level of complexity (Ofori-Dankwa, *et al.*, 2001) time is perceived as non-linear and behaviours show shifting patterns of time orientation configurations. Here the focus is on the interactive and catalytic effects of different polychronicity tendencies. For example the time orientation of individuals can serve as a catalyst for group-level polychronic behaviour (Waller, *et al.*, 1999).

Although this study was primarily conducted at the simplest level of complexity in terms of the complexity hierarchy of Ofori-Dankwa, *et al.*, (2001), it contains hints of influences from levels three and four. For example, Table 6.3 show that time-use preferences in the sample of clinical trial professionals vary from a highest score of 5.67 (item 21) to a lowest score of 2.67. On a continuum scale varying from 1 to 7, this is a large spread in scores indicating the co-existence of very monochronic perspectives and very polychronic perspectives, in line with the observations under level three of the complexity hierarchy. In similar vein the presence of a level four influence is visible through the influence of the more polychronic managers on the perceptions of the more monochronic CRA's. This does not make the CRA's more polychronic, but it is shown in Figure 6.1 that it creates awareness amongst CRA's that the Managers expect a more polychronic behaviour.

7.5.2 Preference for polychronic behaviour

Analysing the job-fit and employee satisfaction profile of professional staff in retail pharmacies (pharmacists and pharmaceutical technicians); it was found that employees with a higher level of polychronic-orientation have higher job satisfaction (Arndt, Arnold & Landry, 2006). A polychronic orientation is therefore important because it is directly related to managing the direct costs of turn-over, as well as the indirect increased customer costs from employee defection.

Polychronic behaviour was also found to be more compatible with the structural or job design aspects of a learning organisation such as variety, autonomy and availability (Benabou, 1999). The same study also found that monochronic behaviour was found to be more compatible with planning, deadlines and coordination.

Researching work force diversity, temporal dimensions and team performance, Saji (2004:49) stated that, 'from a project management point of view, polychronicity is a vital skill for project leaders to develop. Projects by definition represent a series of complex or interrelated activities requiring that attention being paid to multiple operations in various stages at the same time to be completed in the near future'. Polychronicity also forms part of a portfolio of temporal skills, identified by Thoms and Pinto (1999), to match the various tasks and situations that project leaders/managers are called upon to address.

It is evident from the observations made in this study (the frequency distributions of Figure 6.1, the mean polychronicity values of Table 6.3, the rejection of H6) that Managers in the clinical trial environment want CRA's to behave more polychronic. The data collected in this study can not provide insight into why Managers want CRA's to be more polychronic. However, based on the literature discussion in this section it is suggested that Managers would expect higher organisational efficiencies, higher job fit, better employee satisfaction and lower employee turn-over with higher levels of polychronicity.

7.6   Conclusions

There are three main conclusions that can be drawn from the results presented in Chapter 6. Firstly, CRA's are very well informed about the time-use behaviours expected of them by their managers and the organisation. This was most strongly demonstrated by the rejection of hypothesis H6 and the changes made to the theoretical model underlying this study. This conclusion also reflects positively on the organisational alignment between CRA's perceptions and their Managers' expectations. Whether it is through good communication processes in the organisation or through the high degree of standardisation that prevails inside a clinical trial project organisation, or through some other process in the organisation, is not so important. What is important to note is that CRA's know their Managers want them to exhibit more polychronic behaviour.

Secondly, CRA's are more monochronic in their time-use behaviour preference than polychronic. At the same time Managers are more polychronic in their time-use behaviour expectations than CRA's. These two points are clearly demonstrated in the frequency plots shown in Figure 6.1. This means that CRA's prefer to behave less polychronic than what their Managers want them to be. CRA's, by the nature of their work, deals directly with the planning, scheduling and coordination of the clinical trial projects. In line with the findings of Benabou (1999), this role will naturally require a more monochronic time orientation. Managers on the other hand deal with staff issues, wellbeing of the role players in clinical trial projects and the higher level coordination of projects which require less detail but more activities that happen at the same time. Again, this role according to the results of Benabou (1999) and Saji (2004) requires a more polychronic approach to time-use. Therefore, this conclusion is consistent with the expected behaviours for these roles in the organisation.

Figure 6.1 also demonstrates a more balanced distribution of time-use behavioural expectations for Managers than the distribution of time-use behaviours displayed by the CRA's. This was attributed to Managers being a more mature group of people and, being also more polychronic, better at socializing and discussing amongst themselves their opinions and expectations about CRA behaviour.

Thirdly, in contrast to numerous studies in this field (Kaufman-Scarborough, *et al.*, 1999; Cunha, *et al.*, 2004; Norris, *et al.*, 2005), no significant group influence could be found in this study of demographic variables such as Cultural Heritage, Place of Origin and Age, on the polychronicity scores of respondents. This conclusion is based, on the one hand, on the lack of statistical power in the research sample to support the contrary viewpoint. On the other hand, it has also been argued that the research sample is drawn from a group of professionals who probably all have tertiary education and who operate in an extremely structured project environment. These circumstantial, or environmental, factors could have a strong moderating effect on the otherwise strong underlying drivers of time-use behavioural drivers such as cultural heritage and age. There is also a natural selection process taking place in this environment in terms of which new recruits (specifically CRA's) by themselves are attracted to this environment because of the degree of structure and standardisation that it offers. The net result of this would be the kind of well defined frequency distribution of time-use preferences shown in Figure 6.1, and the largely monochronic profile of the successful candidates (who were taken into this research sample). This argument is supported by the negative correlations found by Benabou (1999) between polychronicity and preferences for various aspects of an organisation's temporal culture. Benabou (1999:263) argued that "the significant negative correlations confirmed that polychronic individuals tend to avoid institutions where time is relatively strictly divided, organised and controlled, where deadlines are important and where emphasis is placed on punctuality. The fact that polychronic individuals are comfortable with several activities conducted simultaneously, attach less importance to procedures, prefer to organise work to suit themselves, and perceive the world in a less compartmentalized fashion than monochronic individuals explains the relationships that were found with routine, autonomy and separation between work time and personal time".

7.6.1 Limitations of the data and future research

The statistical power of the analysis is a direct consequence of the sample sizes used in the study. Once the over-all data set is divided into the groups and sub-groups according to the experimental design underlying the study, some sub-groups ended up with very little data items, and in some cases none, from which analytical information could be extracted. On the other hand, since the measuring instrument used, the Inventory of Polychronic Values, has been shown to have very high reliability, an increase in sample size, and hence statistical power, will not necessarily lead to a different outcome. It may only add a more convincing statistical significance to the same outcome.

The research was designed to provide very basic information and confirmation of an equally basic theoretical model. The set of results can not be used to provide insight into causal relationships behind the time-use behaviours observed. Future research may focus on the attributes associated with the time-use behaviours of CRA's and Managers and use factor analysis techniques to extract causal information. It would be of particular interest to understand and qualify the notion that work related environmental factors such as "level of education" and "level of structure in the work place" can moderate underlying drivers of time-use behaviour such as cultural heritage, place of origin and age and create a more homogeneous time-use behavioural landscape.

The organisational or perceptions gap measured in this study is noted as a benchmark and on its own can not be used to justify an initiative to change, refine or adapt project management or recruitment procedures to better suit people of diverse polychronicity scores in the organisation.

The research results from this study may have very limited content and construct validity due to the limited research sample size. To a large extent the good scale validity of the overall data set used provides credibility to the results shown in this study.

7.6.2 Recommendations

The clinical trial environment is highly structured since the trial project has a strict experimental design and standard operating procedures that need to be implemented and supervised. Any deviations from the experimental design or standard operating procedures could lead to a case, or in extreme situations the entire project, being removed from the research programme. Therefore the results from this study showing a

relative monochronic CRA population that could be justified in terms of their given roles as primary supervisors over the execution of these standard operating procedures.

Not mentioned in this study so far is the increasing trend amongst clinical research organisations that CRA's operate from home–offices, sometimes as independent sub-contractors to the clinical research organisations. This trend indicates a demand by CRA's for more pragmatic time arrangements from employers. Based on the research by Karsten and Leopold (2003), a possible solution could be found in employers managing the interface between the temporally asymmetric domains of organisational and domestic space through the mediation of professional relationships with their CRA's. This may require a recalibration by employers in this space of their perceptions of the boundaries between home and work.

Secondly, the processes involved in recruitment and induction of CRA's and Managers may require a refinement in terms of the differences in time orientation required between CRA's and Managers. Human resource managers could attempt to identify the time-style of their organisation and interview for individuals that will be a good match. Hiring based on matching work-styles with the job represents a low-cost investment with a high potential payoff. The Inventory of Polychronic Values (IPV) represents a validated psychometric measure of polychronicity and can be easily administered to predict people's relative polychronicity or monochronicity.

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Appendix 1: Cover letter to Respondents

Dear respondent,

I am writing to request your personal participation in a research project being conducted within the Graduate School of Business at UNISA. The purpose of this study is to assess the cultural dimension of time orientation of Clinical Research Associates and their direct managers (Clinical Trial Managers or Lead CRA's) in the context of the clinical trial project management environment, and its implications for future project management training of Clinical Research Associates and Clinical Trial Managers. Time orientation is a cultural concept that shapes our living experiences according to our own preferences and expectations. The study is a major component of my Master in Business Leadership studies.

The questionnaire consists of twenty items for CRA's and a few more demographic details to be provided. In total it would provide you with approximately twenty to thirty minutes of fun. For CTM's or Lead CRAs it is half the size. The questionnaire is in electronic format and can be accessed and completed on-line by clicking on the Questionnaire icon below. Your responses will remain completely confidential. For analysis and reporting purposes your responses will be combined with those from other companies.

Please answer all questions of the survey. If you have any queries or require further clarification regarding any part of the survey, please do not hesitate to contact myself. On completion of the questionnaire, please select the "send" option on the form to log out of the questionnaire.

If you would like to receive a summary of the main findings of my research, please include your business card details in the appropriate section of the electronic questionnaire form.

I would like to take this opportunity to express my appreciation for your cooperation in completing and returning this questionnaire by October 31 2007, and to thank you for your valuable assistance with my research.

Yours sincerely.

Koretha Ras
Cell: (083) 293 3328
e-mail: haras@telkomsa.net

Appendix 2: The Index of Polychronic Values scale

Item	1 Strongly disagree	2 Moderately disagree	3 Slightly agree	4 Neither agree nor disagree	5 Slightly agree	6 Moderately Agree	7 Strongly Agree
1. We like to juggle several activities at the same time							
2. We would rather complete an entire project every day than complete parts of several projects (R)							
3. We believe people should try do many things at once							
4. When we work by ourselves, we usually work on one project at a time (R)							
5. We prefer to do one thing at a time (R)							
6. We believe people do their best work when they have many tasks to complete							
7. We believe its best to complete one task before beginning another (R)							
8. We believe it is best for people to be given several tasks and assignments to perform							
9. We seldom like to work on more than a single task or assignment at the same time (R)							
10. We would rather complete parts of several projects every day than complete an entire project							

Source: Bluedorn, A.C, Kalliath, T.J, Strube, M.J. and Martin, G.D. (1999:210)

Appendix 3: Adaptation of the Index of Polychronic Values scale

Original Measuring Scale for determining time orientation of respondent

	strongly agree	moderately agree	slightly agree	neither agree nor disagree	slightly agree	moderately disagree	strongly disagree
	7	6	5	4	3	2	1
1. We like to juggle several activities at the same time							
2. We would rather complete an entire project every day than complete parts of several projects							
3. We believe people should try to do many things at once							
4. When we work by ourselves, we usually work on one project at a time							
5. We prefer to do one thing at a time							
6. We believe people do their best work when they have many tasks to complete							
7. We believe it is best to complete one task before beginning another							
8. We believe it is best for people to be given several tasks and assignments to perform							
9. We seldom like to work on more than a single task or assignment at the same time							
10. We would rather complete parts of several projects every day than complete an entire project							

Adapted from: Bluedorn, A.C, Kalliath, T.J, Strube, M.J. and Martin, G.D. (1999:218)

Scale adapted for CRA's by replacing "We" by "I".

	strongly agree	moderately agree	slightly agree	neither agree nor disagree	slightly agree	moderately disagree	strongly disagree
	7	**6**	**5**	**4**	**3**	**2**	**1**
1. I like to juggle several activities at the same time							
2. I would rather complete an entire project every day than complete parts of several projects							
3. I believe people should try to do many things at once							
4. When I work by myself, I usually work on one project at a time							
5. I prefer to do one thing at a time							
6. I believe people do their best work when they have many tasks to complete							
7. I believe it is best to complete one task before beginning another							
8. I believe it is best for people to be given several tasks and assignments to perform							
9. I seldom like to work on more than a single task or assignment at the same time							
10. I would rather complete parts of several projects every day than complete an entire project							

Adapted from: Bluedorn, A.C, Kalliath, T.J, Strube, M.J. and Martin, G.D. (1999:218)

Scale adapted for use by CRA's about "My manager about me"

	strongly agree	moderately agree	slightly agree	neither agree nor disagree	slightly agree	moderately disagree	strongly disagree
	7	6	5	4	3	2	1
1. My manager likes me to juggle several activities at the same time							
2. My manager would rather wants me to complete an entire project every day than complete parts of several projects							
3. My manager believes people should try to do many things at once							
4. When I work by myself, my manager prefers me to usually work on one project at a time							
5. My manager prefers me to do one thing at a time							
6. My manager believes people do their best work when they have many tasks to complete							
7. My manager believes it is best to complete one task before beginning another							
8. My manager believes it is best for people to be given several tasks and assignments to perform							
9. My manager seldom likes me to work on more than a single task or assignment at the same time							
10. My manager would rather that I complete parts of several projects every day than complete an entire project							

Adapted from: Bluedorn, A.C, Kalliath, T.J, Strube, M.J. and Martin, G.D. (1999:218)

Scale adapted for CTM's about CRA's

	strongly agree	moderately agree	slightly agree	neither agree nor disagree	slightly agree	moderately disagree	strongly disagree
	7	6	5	4	3	2	1
1. CRA's should juggle several activities at the same time							
2. CRA's should rather complete an entire project every day than complete parts of several projects							
3. I believe CRA's should try to do many things at once							
4. When CRA's work by themselves, they usually work on one project at a time							
5. CRA's prefer to do one thing at a time							
6. I believe CRA's do their best work when they have many tasks to complete							
7. I believe it is best to complete one task before beginning another							
8. I believe it is best for CRA's to be given several tasks and assignments to perform							
9. I seldom like to work on more than a single task or assignment at the same time							
10. I would rather complete parts of several projects every day than complete an entire project							

Adapted from: Bluedorn, A.C, Kalliath, T.J, Strube, M.J. and Martin, G.D. (1999:218)

Appendix 4: Demographic Profiling Template

Gender				Male	Female

Age	Equal or less than 20y	Equal or less than 30y	Equal or less than 40y	Equal or less than 50y	Equal or less than 60y

Cultural heritage	African (Black)	European (White)	Asian (Far East)	Indian	Other? Please specify (Optional)

Nationality		RSA	Other? Please specify.

Place of origin	City	Town or Village	Rural

Title	CRA	Lead CRA or Clinical Trial Manager

Appendix 5: Statistical outputs from ANOVA

Factor: Age (recoded):

2 = equal or less than 30 years
3 = equal or less than 40 years
4 = combining all in the interval of 40 - 60 years

		Sum of Squares	df	Mean Square	F	Sig.
item 1	**Between Groups**	13.396	2	6.698	2.811	.068
	Within Groups	150.134	63	2.383		
	Total	163.530	65			
item 2	**Between Groups**	20.110	2	10.055	2.650	.079
	Within Groups	239.057	63	3.795		
	Total	259.167	65			
item 3	**Between Groups**	6.448	2	3.224	1.132	.329
	Within Groups	179.506	63	2.849		
	Total	185.955	65			
item 4	**Between Groups**	13.769	2	6.885	1.912	.156
	Within Groups	226.897	63	3.602		
	Total	240.667	65			
item 5	**Between Groups**	4.143	2	2.071	.672	.514
	Within Groups	194.112	63	3.081		
	Total	198.255	65			
item 6	**Between Groups**	2.599	2	1.299	.362	.698
	Within Groups	226.431	63	3.594		
	Total	229.030	65			
item 7	**Between Groups**	9.620	2	4.810	1.620	.206
	Within Groups	187.046	63	2.969		
	Total	196.667	65			
item 8	**Between Groups**	14.992	2	7.496	2.714	.074
	Within Groups	173.993	63	2.762		
	Total	188.985	65			
item 9	**Between Groups**	13.164	2	6.582	2.325	.106

		Sum of Squares	df	Mean Square	F	Sig.
	Within Groups	178.367	63	2.831		
	Total	191.530	65			
item 10	Between Groups	29.750	2	14.875	4.607	.014
	Within Groups	203.417	63	3.229		
	Total	233.167	65			
item 11	Between Groups	8.638	2	4.319	1.602	.210
	Within Groups	169.801	63	2.695		
	Total	178.439	65			
item 12	Between Groups	9.069	2	4.535	1.483	.235
	Within Groups	192.689	63	3.059		
	Total	201.758	65			
item 13	Between Groups	2.340	2	1.170	.381	.685
	Within Groups	193.599	63	3.073		
	Total	195.939	65			
item 14	Between Groups	8.204	2	4.102	1.358	.265
	Within Groups	190.296	63	3.021		
	Total	198.500	65			
item 15	Between Groups	5.394	2	2.697	.701	.500
	Within Groups	242.364	63	3.847		
	Total	247.758	65			
item 16	Between Groups	1.296	2	.648	.260	.772
	Within Groups	156.825	63	2.489		
	Total	158.121	65			
item 17	Between Groups	8.397	2	4.198	1.377	.260
	Within Groups	192.043	63	3.048		
	Total	200.439	65			
item 18	Between Groups	.988	2	.494	.224	.800
	Within Groups	138.952	63	2.206		
	Total	139.939	65			
item 19	Between Groups	5.123	2	2.561	.767	.469
	Within Groups	210.407	63	3.340		
	Total	215.530	65			
item 20	Between Groups	5.178	2	2.589	.933	.399
	Within Groups	174.777	63	2.774		

		Sum of Squares	df	Mean Square	F	Sig.
	Total	179.955	65			
item21	Between Groups	1.897	2	.949	.377	.688
	Within Groups	108.212	43	2.517		
	Total	110.109	45			
item22	Between Groups	5.898	2	2.949	.806	.453
	Within Groups	157.341	43	3.659		
	Total	163.239	45			
item23	Between Groups	2.993	2	1.497	.483	.620
	Within Groups	133.115	43	3.096		
	Total	136.109	45			
item24	Between Groups	7.939	2	3.969	1.158	.324
	Within Groups	147.365	43	3.427		
	Total	155.304	45			
item25	Between Groups	.350	2	.175	.055	.947
	Within Groups	136.976	43	3.185		
	Total	137.326	45			
item26	Between Groups	2.841	2	1.420	.570	.569
	Within Groups	107.072	43	2.490		
	Total	109.913	45			
item27	Between Groups	7.365	2	3.683	1.018	.370
	Within Groups	155.591	43	3.618		
	Total	162.957	45			
item28	Between Groups	1.589	2	.794	.320	.728
	Within Groups	106.846	43	2.485		
	Total	108.435	45			
item29	Between Groups	1.081	2	.541	.224	.800
	Within Groups	103.788	43	2.414		
	Total	104.870	45			
item 30	Between Groups	.619	2	.309	.091	.913
	Within Groups	146.534	43	3.408		
	Total	147.152	45			
ave_section_1	Between Groups	6.877	2	3.438	3.157	.049
	Within Groups	68.616	63	1.089		
	Total	75.493	65			

		Sum of Squares	df	Mean Square	F	Sig.
ave_section_2	Between Groups	2.842	2	1.421	1.377	.260
	Within Groups	65.028	63	1.032		
	Total	67.870	65			
ave_section _3	Between Groups	.327	2	.164	.157	.855
	Within Groups	44.776	43	1.041		
	Total	45.104	45			

Factor: Cultural Heritage (recoded)

1. African (Black) and Indian combined
2. European (White)

		Sum of Squares	df	Mean Square	F	Sig.
item 1	Between Groups	1.370	1	1.370	.548	.462
	Within Groups	149.872	60	2.498		
	Total	151.242	61			
item 2	Between Groups	5.176	1	5.176	1.295	.260
	Within Groups	239.872	60	3.998		
	Total	245.048	61			
item 3	Between Groups	12.658	1	12.658	5.173	.027
	Within Groups	146.826	60	2.447		
	Total	159.484	61			
item 4	Between Groups	1.459	1	1.459	.380	.540
	Within Groups	230.090	60	3.835		
	Total	231.548	61			
item 5	Between Groups	2.427	1	2.427	.837	.364
	Within Groups	173.935	60	2.899		
	Total	176.362	61			
item 6	Between Groups	9.837	1	9.837	2.946	.091
	Within Groups	200.372	60	3.340		
	Total	210.210	61			
item 7	Between Groups	2.624	1	2.624	.850	.360

		Sum of Squares	df	Mean Square	F	Sig.
	Within Groups	185.264	60	3.088		
	Total	187.887	61			
item 8	Between Groups	.275	1	.275	.095	.760
	Within Groups	174.435	60	2.907		
	Total	174.710	61			
item 9	Between Groups	.059	1	.059	.020	.888
	Within Groups	177.489	60	2.958		
	Total	177.548	61			
item 10	Between Groups	.013	1	.013	.004	.953
	Within Groups	216.326	60	3.605		
	Total	216.339	61			
item 11	Between Groups	7.732	1	7.732	2.818	.098
	Within Groups	164.655	60	2.744		
	Total	172.387	61			
item 12	Between Groups	.930	1	.930	.308	.581
	Within Groups	181.264	60	3.021		
	Total	182.194	61			
item 13	Between Groups	21.914	1	21.914	8.458	.005
	Within Groups	155.457	60	2.591		
	Total	177.371	61			
item 14	Between Groups	9.259	1	9.259	3.118	.083
	Within Groups	178.177	60	2.970		
	Total	187.435	61			
item 15	Between Groups	.985	1	.985	.252	.618
	Within Groups	234.902	60	3.915		
	Total	235.887	61			
item 16	Between Groups	14.025	1	14.025	6.416	.014
	Within Groups	131.152	60	2.186		
	Total	145.177	61			
item 17	Between Groups	4.320	1	4.320	1.359	.248
	Within Groups	190.728	60	3.179		
	Total	195.048	61			
item 18	Between Groups	10.433	1	10.433	5.643	.021
	Within Groups	110.937	60	1.849		

		Sum of Squares	df	Mean Square	F	Sig.
	Total	121.371	61			
item 19	Between Groups	.575	1	.575	.171	.681
	Within Groups	202.264	60	3.371		
	Total	202.839	61			
item 20	Between Groups	15.537	1	15.537	6.284	.015
	Within Groups	148.351	60	2.473		
	Total	163.887	61			
item21	Between Groups	.293	1	.293	.117	.734
	Within Groups	109.816	44	2.496		
	Total	110.109	45			
item22	Between Groups	8.364	1	8.364	2.376	.130
	Within Groups	154.875	44	3.520		
	Total	163.239	45			
item23	Between Groups	.865	1	.865	.282	.598
	Within Groups	135.243	44	3.074		
	Total	136.109	45			
item24	Between Groups	10.989	1	10.989	3.350	.074
	Within Groups	144.316	44	3.280		
	Total	155.304	45			
item25	Between Groups	.773	1	.773	.249	.620
	Within Groups	136.553	44	3.103		
	Total	137.326	45			
item26	Between Groups	2.018	1	2.018	.823	.369
	Within Groups	107.895	44	2.452		
	Total	109.913	45			
item27	Between Groups	3.983	1	3.983	1.102	.299
	Within Groups	158.974	44	3.613		
	Total	162.957	45			
item28	Between Groups	.224	1	.224	.091	.764
	Within Groups	108.211	44	2.459		
	Total	108.435	45			
item29	Between Groups	9.896	1	9.896	4.585	.038
	Within Groups	94.974	44	2.158		
	Total	104.870	45			

		Sum of Squares	df	Mean Square	F	Sig.
item 30	Between Groups	1.100	1	1.100	.331	.568
	Within Groups	146.053	44	3.319		
	Total	147.152	45			
ave_section_1	Between Groups	1.997	1	1.997	1.729	.194
	Within Groups	69.309	60	1.155		
	Total	71.306	61			
ave_section_2	Between Groups	6.872	1	6.872	7.053	.010
	Within Groups	58.465	60	.974		
	Total	65.337	61			
ave_section _3	Between Groups	.095	1	.095	.093	.762
	Within Groups	45.009	44	1.023		
	Total	45.104	45			