

**THE COMPARISON OF BEHAVIOURAL PATTERNS OF TOP ACHIEVERS  
FROM DIVERSE WORK ENVIRONMENTS: AN ANALYSIS OF SHADOWMATCH  
DATABASE BENCHMARKS**

by

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A mini-dissertation submitted in partial fulfilment of the requirements for the degree

MA Research Psychology

in the Department of Psychology at the

UNIVERSITY OF PRETORIA

FACULTY OF HUMANITIES

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March 2016

*“We are what we repeatedly do.*

*Excellence, then, is not an act, but a habit.”*

– Aristotle, 312BC.

# COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

## DECLARATION

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Title of thesis/dissertation/mini-dissertation:

**The comparison of behavioural patterns of top achievers from diverse work environments: An analysis of Shadowmatch database benchmarks**

I, **Suzanne Nolte**, declare that the mini-dissertation, which I hereby submit for the degree of MA Research Psychology at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution. This mini-dissertation is my own work and, where applicable, every effort has been made to correctly reference the work of other authors.

Signed this \_\_\_\_\_ day of \_\_\_\_\_ 2016

\_\_\_\_\_

Signature

**ETHICS STATEMENT**

The author, whose name appears on the title page of this dissertation, has obtained, for the research described in this work, the applicable research ethics approval. The author declares that she has observed the ethical standards required in terms of the University of Pretoria's Code of ethics for researchers and the Policy guidelines for responsible research.

**ACKNOWLEDGEMENTS**

Throughout the current study various people shared with me their wisdom, gave me guidance and supported me, some academically and some personally. I would like to acknowledge these incredible people and thank them for helping me to complete this mini-dissertation. My sincere gratitude goes to the following people, some of whom were directly involved in my research and others who have otherwise contributed to my academic and personal growth:

My supervisor, Prof. Claire Wagner

My co-supervisor, Prof. David Maree

Pieter de Villiers

Lizette de Villiers

Michael Mattern

Jo-Marie Barlow

Jurie Geldenhuys

**With special thanks to my parents,**

Chrissie and Frik Nolte

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### Abstract

The aim of the current study was to compare the behavioural patterns of top achievers from diverse work environments, as measured by the Shadowmatch worksheet. The study set out to explore the possibility of similarity between the behavioural patterns of top achievers, and if similarities are present, the extent of these similarities. The research question posed by the study was how do the behavioural patterns (habits) of top achievers from diverse work environments compare? The data of 320 top achievers was collected from the existing Shadowmatch database. By using the statistical analysis technique of profile analysis to compare the 19 habits measured by the Shadowmatch worksheet between eight different types of top achievers, insight was gained into the habits of top achievers. The results of the current study highlighted the habit of discipline as the habit overall expressed at the highest level of intensity by various types of top achievers. The habit of discipline was thus highlighted as is a crucial habit shared by different types of top achievers. The current study provided information on which attributes and actions in life lead to individuals achieving in their particular environments, thereby contributing towards a positive psychology. The study recommended further research on the interaction of achievement and habits to address the need for more focused research and theory building together with effective application of positive behaviour of employees in organisations.

**Keywords:** achievement; behavioural patterns; habits; profile analysis; Shadowmatch

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### CHAPTER 1: INTRODUCTION

Chapter 1 is an introduction to the current study. The chapter introduces the background of the research problem, research question, theoretical point of departure, justification aims and objectives of the study. This is followed by a brief description of the research methodology and a chapter outline of this mini-dissertation.

#### 1.1 Background

Gillham and Seligman (1999) emphasized that “We desperately need a positive psychology that provides us with information about how to build virtues like creativity, hope, future-mindedness, interpersonal skill, moral judgment, forgiveness, *humor [sic]* and courage and how to enhance happiness and life satisfaction” (p. S169). Psychology is at a point where the focus of research can shift from preventing and treating psychopathologies to exploring the drive towards life satisfaction and enhancing human strengths. The research problem of the current study stemmed from the motivation to gain insight into which attributes and actions in life lead to individuals achieving in their particular work environments, and to conduct empirical psychological research on the behavioural patterns or habits of top achievers. More than 2000 years ago Aristotle emphasised the importance of habits; “We are what we repeatedly do. Excellence, then, is not an act, but a habit.” – Aristotle, 312BC. The current study stemmed from the motivation to explore the habits that achievers in the workplace display. The focus on excellence and achievement rather than failure is in line with the theoretical approach of positive psychology. The current study sought to explore if different types of achievers share similar behavioural patterns or if their behaviours differ, to contribute to the understanding of the behaviour of achievers. The research problem was addressed to help expand the quite limited research on this specific topic within the field of

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psychology. Chapter 2 addresses the extent of the literature on the constructs of habits and achievement.

Shadowmatch was a central element in the process of delineating the research problem in the current study. Shadowmatch is an internet based online instrument that finds the best match between the behavioural patterns or habits of an individual, the environment where a task will be performed and the task/job to be done. The Shadowmatch assessment is a worksheet consisting of 68 questions that asks the participant how he/she will behave in different day-to-day situations. The results of the worksheet identify the individual's behavioural patterns; it shows how well and matured the individual's habits are formed. The results of the worksheet are communicated in a graph that indicates the extent to which the various habits measured by the worksheet are established or not. A score out of 100 indicates the intensity of each measured habit. This score is depicted on a graph ranging from planned behaviour (low intensity forced decisions) to radical behaviour (habitual naturally applied behaviour) (Shadowmatch, 2015).

In order to match these behavioural patterns or habits to the environment and specific job to be done, a benchmark is created by the following process: The top performers doing a specific job in a specific environment are identified. Each top achiever completes the Shadowmatch worksheet individually and the results are combined into one graph. This graph becomes the benchmark for the habits necessary to do the job successfully in that specific environment. Other individuals are then matched against this benchmark to indicate the individual's propensity to becoming successful at doing the same job in that specific working environment (De Villiers, 2009). The top achievers are identified by the company or environment's performance scoring system. The company therefore first had to implement a performance scoring system to assess the individuals in the environment before the

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Shadowmatch system could be applied. Only after the performance scoring system had been in place for the required period of eight months, could the individuals be assessed to determine who the top achievers were. There are currently 283 396 completed worksheets/individuals on the Shadowmatch system (Shadowmatch, 2015). A portion of this existing database of completed worksheets was used as the source of data for the study.

In the Shadowmatch system the top achieving group of individuals most congruent in their behavioural habits make up a benchmark for a particular work environment. The benchmark forms the “shadow” against which other prospective individuals are measured to determine the individual’s match to the environment and their propensity to succeed in the same environment. The current study explored benchmarked behavioural patterns or habits identified in the functioning of top achievers in the work environment to determine if there are similarities in these behavioural patterns or habits across diverse work environments. In the current study, a behavioural pattern or habit refers to “an action that repeats itself with no conscious planning” (De Villiers, 2009, p.18).

### **1.2 Justification, aim and objectives**

The current study set out to contribute to the broader knowledge base of the field of psychology by addressing the research question. Specifically, the study aimed to provide insight into the dynamics of the behavioural patterns or habits of top achievers. The findings could assist in the development of necessary measurement instruments unique to the South African population, thereby moving away from those methods developed in countries outside of South Africa. The measurement was developed, standardised and validated in South Africa with South African individuals. This grants the chance to use South African based measurements and data to gain insight into the behavioural patterns or habits of South African top achievers.

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Allowing individuals to put their strengths to work can empower them and the environment surrounding them (Moradi, Nima, Ricciardi, Archer, & Garcia, 2014). The individual can enhance his or her strengths in this empowered environment. The field of positive psychology has shifted the focus of psychology to addressing matters such as these, thereby creating the ideal environment to do research on the behaviour of top achieving individuals.

The main aim of the proposed study was to determine if there are specific behavioural patterns or habits that are shared by the benchmark of top achievers from various work environments. To meet the aim of the study the following objectives were set out to:

- Explore the extent to which each behavioural pattern or habit, as identified by the Shadowmatch worksheet, occurs across different work environments.
- Identify the behavioural patterns or habits which occur most frequently across different work environments.
- Identify the behavioural patterns or habits which occur most infrequently across different work environments.

### **1.3 Research question**

The current study sought to compare the behavioural patterns of top achievers from diverse work environments, as measured by the Shadowmatch worksheet, to explore the possibility of similarity between the behavioural patterns, and if similarities are present, the extent of these similarities. The study therefore posed the following research question: How do the behavioural patterns (habits) of top achievers from diverse work environments compare?

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### **1.4 Theoretical framework**

The paradigmatic point of departure of the current study fell within the paradigm of positive psychology. The aim of this paradigm is to catalyze change in the field of psychology, away from a constant pre-occupation with preventing and fixing the worst aspects of life and towards focusing on developing the best qualities in individuals (Seligman, 2002). Positive psychology is centered on positive subject experiences in the past and present and constructive cognitions regarding the future. It is centered on positive personal traits and civic virtues and institutions that move individuals to become better (Seligman, 2002). Some theories that were influenced by this paradigm and how they informed the current study are outlined in Chapter 2.

### **1.5 Description of research methodology**

The research design of the proposed study was a non-experimental descriptive research design. The details of this research design are discussed in Chapter 3. The behavioural patterns or habits of top achievers were compared across different workplace benchmarks. The selected benchmarks of top achievers were compared with regards to the 19 behavioural patterns or habits as identified and defined by the Shadowmatch system. (Appendix A lists these habits with their definitions.) The benchmarks were selected from the existing Shadowmatch database, the source of data for the current study (Shadowmatch, 2015).

The sampling method in the current study was stratified random sampling (Gravetter & Forzano, 2012). This method involved selecting equal sized random samples from the variety of identifiable subgroups that exist within a population. This was done to ensure a representative sample of the population by sufficiently representing each subgroup in the sample. Chapter 3 addresses the research methodology of the current study.

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The data analysis process that was administered in the current study was done in SPSS—Statistical Package for the Social Sciences (Pallant, 2013). The first part of the data analysis was the descriptive statistical analysis of the variables – the 19 behavioural patterns measured by the Shadowmatch worksheet. This was followed by profile analysis, the main method of statistical analysis of the current study. Profile analysis is the multivariate alternative to repeated measures ANOVA (analysis of variance) done in SPSS (Pallant, 2013). Profile analysis is the method of data analysis that allowed the researcher to analyse the 19 different behavioural pattern scores across the different groups/strata in the data. Chapter 4 addresses the results of the data analysis process of the current study.

### **1.6 Chapter outline**

This section briefly outlines the chapters in the mini-dissertation. Each chapter addresses a different aspect of the current study.

Chapter 1 – Introduction: This chapter consists of a description of the research problem, an introduction to Shadowmatch, the research question, a brief description of the theoretical point of departure, justifications, aims and objectives, a brief description of the research methodology and the outline for this chapter.

Chapter 2 – Literature review: This chapter gives an overview of the literature concerned with behavioural patterns or habits, achievement and the conjunction of habits and achievement, as well as the outline of the theoretical point of departure of the current study.

Chapter 3 – Research methodology: This chapter communicates the research design used in the current study, details regarding the sampling method, the measurement instrument, the data collection procedure, the data analysis process, as well as the ethical considerations applicable to the current study.

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Chapter 4 – Results: This chapter is the presentation of the results of the data analysis and communicates the results of the current study.

Chapter 5 – Discussion, recommendations and conclusion: This chapter includes the discussion of the results of the current study, limitations of the study, recommendations for future research and conclusions regarding the current study.

Chapter 1 served as an introduction to the current study. Chapter 2 will focus on reviewing the literature relevant to the study and outlining the theoretical point of departure of the study.

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### CHAPTER 2: LITERATURE REVIEW

Chapter 2 provides an overview of previous research that explored the aspects of achievement and behavioural patterns/habits. Achievement and habits were the focus of the current study; these aspects are firstly considered separately to form a basis of understanding before considering them together. The first section is concerned with habits, outlining and defining behavioural patterns and with what is known so far with regards to this. Thereafter, the research on achievement is communicated. Finally, the aspects of habits and achievement are considered in conjunction, outlining what has been explored thus far in this domain. This indicates where the need for further research lies regarding these constructs, and how the current study could integrate into the broader understanding of these constructs. The last section of this chapter addresses the theoretical point of departure of the current study.

#### 2.1 Habits

At the base of the understanding of habits is the work of William James. He was the first person to offer a course in psychology in the United States. James's work helped establish psychology as a separate discipline and lay out some fundamental principles of psychology. Just as fundamental as James's principles were to the science of psychology, so crucial is his work to the current study and its understanding of habits. The work of James is pivotal to the current study since he is considered as one of the founders of positive psychology; the theoretical framework from which the current study stems. He is considered a founder of this field because he was deeply interested in the subjectivity of a person. This is pivotal for the theoretical framework, but of more important consideration here are his views of habits. James (1890) viewed habits such a crucial part of human behaviour and existence that it made up one of the four methods in his work of 1890, alongside the stream of consciousness, emotion and will. He argued that habits are constantly formed to achieve

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certain results. He went as far as to refer to living creatures as bundles of habits and that the laws of nature are the habits that elements follow in their reactions with each other. James explained that habit diminishes the conscious attention with which actions are performed. The essential nature of habit is that as habituation occurs to produce the same effect, a less amount of outward cause is needed than at the start. Doing something for the first time takes more effort, but the resistance is overcome as habituation occurs. These are fundamental aspects of habits that were further explored in the field of psychology at a later stage. This chapter aims to address a few of the major explorations with regards to habits.

The next description of a habit to consider is: “A habit, from the standpoint of psychology, is a more or less fixed way of thinking, willing, or feeling acquired through previous repetition of a mental experience” (Andrews, 1903, p. 121). When Andrews referred to the standpoint of psychology in this quotation, what did this mean? The field of psychology of 1903 is far different from psychology in 2016 and even different than when James’s (1890) principles of psychology were published. The field has developed and explored many different paradigms and viewpoints. In order to understand what was meant by Andrews in 1903, it should be outlined where the field of psychology was at that stage. When he said this, it was the dawning of the behaviourist paradigm in psychology. It is interesting that Andrews already highlighted the interaction of previous mental experiences with the act of habits. Behaviourists such as Skinner (1938) and Watson (1914) would soon argue that cognitive processes do not mediate the automatic activation of habitual responses to an environment. To address how the views from a century ago compare to fairly current views on habits, a break is taken from the chronological order of the exploration of the construct of habit, to consider the work of Lally, Van Jaarsveld, Potts, and Wardle (2010).

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Nearly a hundred years after Andrews' (1903) description, the question of what a habit is and how it works was asked by Lally et al. (2010). They defined the construct of a habit by explaining how planning and attention is required the first time an action is performed. When this action is repeated within a consistent setting, the process becomes more efficient and less thought is required. The control of the behaviour or action starts to shift to cues within the environment that activate an automatic response – a habit. A habit is therefore a behaviour that now requires less planning and attention than the initial action; a behaviour automatically done when an individual receives a cue from his or her surroundings. This explanation of habits and habit formation aligns well with James's (1890) principles from so many years ago. A habit is once again viewed as diminishing the conscious attention with which actions are performed. More than a hundred years later, however, Lally et al. had access to a larger resource base of research on this construct.

In order to study this habit formation process, Lally et al. (2010) asked 96 volunteers to carry out an activity over a period of 12 weeks in the same context (completing a specific act at the same time of day). Throughout this period the participants completed a self-report habit index. A self-report habit index is an instrument that measures an individual's own perception of their habit strength, whereby the individual reports on the specific behaviour by reporting their own perceptions. The analysis indicated that the time it takes an individual to reach their limit of automaticity (time taken for a specific behaviour to become a habit) varies considerably between individuals. It was found that with repetition of this specific behaviour in the same context, automaticity of the behaviour increased, thereby forming a habit. This study which investigated real-world formation of habits relied on the self-report of participants. Gravetter and Forzano (2012) warn that one of the disadvantages of self-report is that participants can easily distort self-report measures. This can introduce personal bias where perception might not be an objective display of the true intensity or frequency of a

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behaviour. Despite the limitations of self-report, the Lally et al. study contributed to the quest of trying to explore the construct of habits. This self-report method aligned with one of the aspects of the theoretical point of departure of the current study, that is, positive psychology's emphasis on subjective experience. The study emphasised that the duration of habit formation is different amongst various individuals and gave insight into the finer processes of habit formation.

Since the time of James (1890) the field of psychology has developed and explored many different paradigms. The behavioural constructs of habits and habit formation were viewed specifically within a cognitive light by Verplanken and Aarts (1999). These researchers found that habits seem to be accompanied by an enduring cognitive orientation; referred to by them as habitual mind-set. This mind-set decreases the attentiveness of the individual towards new information and action courses, thereby contributing to maintaining the habitual behaviour. The current study does not stem from a cognitive paradigm, but it is interesting to see how the different paradigms within psychology explore habits, each study contributing to a larger understanding of this construct.

Just as the construct of habit has been explored from different paradigms, various aspects of this construct have been explored. The scope of this chapter is, however, not large enough to address all of these aspects, for instance the habitual routines of groups (Gersick & Hackman, 1990). An aspect that does speak specifically to the scope of the current study is the question of whether habits should be interpreted to be the same as frequently occurring behaviour or not. The exploration of this aspect shows how researchers differ with regards to the construct of habits and habit formation. Verplanken (2006) challenged previous works (Hull, 1943; Triandis 1977) that viewed these two factors as equal.

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Verplanken (2006) argued that frequently performed behaviour does not necessarily result in a habit and vice versa, that habit may vary while frequency remains the same. The notion that these two elements are equal will then imply the consequence that habit strength will continue to increase as frequency continues to increase. To explore the notions around these constructs of habit and the frequency of behavioural occurrence Verplanken conducted three studies by means of a longitudinal, cross-sectional and experimental design. It was found that a habit should be understood as a mental construct that involves features of automaticity, or, more specifically, lack of awareness, difficulty to control and mental efficiency. Verplanken explains mental efficiency as the ability to optimally use mental resources to reach the desired mental outcome, such as solving a problem. Automaticity refers to the behaviours that become more spontaneous and self-regulating – behaviours that do not require much detailed attention and thinking from the individual. This emphasised that habits are not only the specific behaviours that an individual performs frequently, but are the behaviours that occur without much awareness or control and draw on mental efficiency processes. The repetition of the behaviour is not the pivotal factor, but rather the automaticity and efficiency of the behaviour.

Verplanken's work contributed to the understanding of habits in various ways. Firstly, Verplanken stressed the matter that there is need for adequate measures of habits; problems with conceptualization of habits implied invalid measures. Therefore, an adequate means of measuring was still needed. Verplanken also emphasized the pivotal fact that frequency of behaviour is not equal to habits. This disagreed with previous notions such as the work of Hull (1943) and Triandis (1977). More insight into the formation of habits was needed. The understanding of habits now involved the notion that it is a mental construct involving features of automaticity, but what about the environment surrounding the individual with

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these mental constructs? Are habits an internal construct of an individual or does the environment develop the habit?

The question of the interaction of environmental cues and habits has been raised by other researchers. Neal, Wood, and Quinn (2006) expressed that habits are response dispositions activated automatically by context cues present with the response during previous performance. In other words, the cues that were present in the environment when the individual performed this specific behaviour in the past now elicit a response from the individual – this response is the behavioural habit. This exhibits the construct of conditioning in a more refined sense than original Pavlovian conditioning (Pavlov, 1927). In habit formation humans are not considered equitable to Pavlov's dog, but are still subject to conditioning in the sense that cues from their environment condition them to continue or discontinue certain behaviour. When the behaviour is continually repeated, it starts to form a habit.

While Neal et al. (2006) emphasised the external environmental cues present during habit formation, other researchers shifted the focus towards factors such as the presence of goals. Other researchers explored other external factors acting as role players in the habit formation process. For example, Aarts and Dijksterhuis (2000) conducted a study on habits as goal-directed automatic behaviour. The study concluded when behaviour is habitual, the specific behavioural response is automatically activated. The study indicated that this automaticity is conditional on the presence of an active goal. In other words, when the presence of a specific active goal is experienced by an individual, the habitual behaviour is automatically activated – the individual does not need to actively think about showing this behaviour, it just happens. Aarts and Dijksterhuis contributed this pivotal notion that an active goal is a role-player within this process of habit formation.

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Different research methodologies have been applied to explore the constructs of habits and habit formation. An effective example of contributing to the understanding of habits from a qualitative perspective is the study conducted by Lally, Wardle, and Gardner (2011) that explored the experience of habit formation. Ten participants documented their experiences of habit development. Just as the work of Lally et al. (2010) did, this qualitative method too aligns with the aspects of subjective experience of positive psychology. The thematic analysis of Lally et al.'s (2011) study revealed three themes surrounding the habit-formation process. Firstly, these themes were strategies used to aid to the initiation of behaviour change. Secondly, they were used for the development of behavioural automaticity and lastly, for selecting effective cues to support repeated behaviour. This study is of importance since it was the first study to describe the experience of habit formation in everyday contexts such as work-based contexts. The study found that a work-based context is a typical area for habit formation. A work-based context refers to the environment in which the individual is present for continued repeated periods of time, with stable and predictable cues which the individual is exposed to repeatedly. These repeated cues in the environment create the ideal backdrop for the process of habit formation. This finding emphasised how a workplace environment can be ideal to explore the habits of individuals, since this is the environment where the habits are formed and developed.

The work of De Villiers (2009) aligns with the findings of Lally et al. (2010). De Villiers (2009) views a habit as “an action that repeats itself with no conscious planning” (p. 18). This view emphasises the nature of the automaticity of habits. De Villiers' work explores how a pattern of behaviour is turned into a habit when the situation is conducive for this behaviour and the individual exhibiting the behaviour has a goal or a purpose. If the environment an individual finds him- or herself in repeatedly exhibits the same cues, this environment will be conducive to forming certain behavioural habits. An individual

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performing day to day tasks in this environment can be seen as performing in range of his/her habits as default. This echoes the discussed aspects of habits and habit formation explored by other researchers (Aarts & Dijksterhuis, 2000; Andrews, 1903; Lally et al., 2010; Neal et al., 2006; Verplanken, 2006). Within the current study the construct of a habit was operationalised according to the description of De Villiers (2009, p.18) as “an action that repeats itself with no conscious planning”. This description combines the previous views as explained previously in this chapter. De Villiers’ (2009) research created the opportunity to explore the behavioural habits in a specific environment, such as a workplace, as emphasised by the findings of Lally et al. (2011).

De Villiers (2009) developed a measurement instrument for measuring the intensity with which certain behavioural patterns are expressed by an individual. This measurement helped to address the need for an adequate measure of habits as expressed by Verplanken (2006). De Villiers’ measurement categorised the frequency and intensity with which a behaviour is expressed within a range of behavioural categories. When behaviour is expressed at a low intensity or more forced decision, the behaviour falls within the category of planned behaviour. This is the first category; thereafter, the category of necessary behaviour follows. Only once the behaviour is measured to the extent of a higher intensity than the first two categories does the behaviour form a pattern, and is the behaviour considered a habit. The next three categories are contextual habits, strong habits and radical habits; the more intensely a habit is expressed the higher it falls within this range of categories. Within the current study the construct of habits was operationalised as explained by De Villiers. The measurement instrument developed by him was used within the current study and will be explained in Chapter 3.

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The findings discussed in this first section of the chapter show part of the understanding of habits and habit formation achieved thus far. Now the opportunity exists to go from general understanding to more focussed research within the understanding of habits. The opportunity exists to explore the habits of specific groups of individuals, for example to gain insight into the habit dynamics of top achieving individuals.

### **2.2 Achievement**

The concept of need of achievement was defined as a positive desire to accomplish tasks and compete successfully with standards of excellence by McClelland, Atkinson, Clark, and Lowell (1953). The current study was concerned with the individual who becomes a top achiever, i.e. the individual who acted on this need for achievement and accomplished and achieved his/her specific achievement. Why is it that only some individuals are driven to achieve and others not? What are the factors that influence achievement or the lack thereof? The insights the exploration of this construct of achievement have yielded are considered next.

Maslow (1943) described the needs that motivate human behaviour in his hierarchy of needs. He placed achievement in the second highest level of his original hierarchy of needs, the level of esteem. In this level he listed self-esteem, respect for others and by others, confidence and achievement. This level emphasizes our need to be valued and accepted by others, a pivotal foundation for the possibility to reach Maslow's (1943) self-actualization. Achievement is therefore not a basic need, but a higher need that only some individuals strive for in life. Only some become top achievers. This raises the question of what the factors are that influence individuals to become top achievers, and also what are the dynamics of the constructs that top achievers possess?

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One of these constructs that was explored is personality. Sixty years ago Durr and Schmartz (1964) explored the personality differences between high-achieving and low-achieving gifted children in a sample of primary school children from various public schools. No evidence was found that relatively poor personality patterns caused low achievement or vice versa, but there was evidence that these two factors tended to be characteristic of the same group of individuals. This study specifically used gifted low and high achievers; the criteria in this study for a gifted individual was a score above the 90<sup>th</sup> percentile on The Lorge Thorndike Non-Verbal Intelligence Test. The California Achievement Test was the measure for achievement; individuals scoring above the 90th percentile in reading achievement were classified as high-achieving, and below 60th percentile classified as low-achieving. Although this study was based on a specific sample, the findings still granted further insight into the personality of top achievers. It emphasized that it is not a simple matter that a poor personality is the cause of low achievement or vice versa.

Another aspect that was explored to assess its influence on achievement was the culture of an individual. The research on the culture of individuals is a broad branch within the field of psychology, but of specific importance to the current study is the research on the individualism-collectivism construct within culture. Hofstede (1980) and Triandis (1972) developed the individualism-collectivism construct. Today, after years of research, individualism-collectivism is the most well-researched dimension of culture (Triandis & Gelfand, 2012). Throughout the exploration of this cultural dimension, it was found that theories of achievement are rooted more in individualism than collectivism (Spence, 1985). It was also found that individualistic cultures placed more importance on achievement; these individuals evaluated achievement values more highly than individuals in collectivistic cultures (Nelson & Shavitt, 2002). These findings of individualism-collectivism pertaining to achievement highlight that an individualistic approach is more connected to achievement than

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a collectivistic approach. The more recent research of Triandis and Gelfand (2012) aligns with these findings of Nelson and Shavitt (2002) and Spence (1985). Triandis' (1995) distinction of vertical and horizontal individualism and collectivism is found in the further divisions of the individualist vs. collectivistic cultural construct. This further distinction argues that vertical individuals are motivated to stand out whilst horizontal individuals avoid standing out. Individualism can be both vertical and horizontal and the same goes for collectivism. Triandis and Gelfand pointed out that a major value of vertical individualists is achievement and vertical individualism increases the change of competition. The findings of Triandis and Gelfand align with earlier findings of Daun (1992) that in vertical individualistic cultures the need for power, prestige and achievement is high. Horizontal individualists value the need to be unique without standing out.

In the exploration of the dynamics of achievement other researchers explored more specific traits of top achievers. Caprara, Barbaranelli, Pastorelli, Bandura, and Zimbardo (2000) explored both pro-social and aggressive behaviours in early childhood to determine if they can be viewed as predictors of academic achievement and peer relations in adolescence. For the purpose of the current study, the focus of the discussion falls on the academic achievement aspect of their study rather than the peer relations aspect. Caprara et al. conducted a longitudinal study with 294 participants. The first phase of the study was when the participants were in the third-grade and five years later the next phase was done. The assessment procedure involved multiple assessments such as self-report, peer and teacher assessment. In the conceptual model of their study the researchers defined pro-social behaviour and physical and verbal aggression as latent variables. They described pro-socialness as including helping, cooperating, sharing and consoling. Their findings indicated that pro-socialness had a strong positive impact on later academic achievement and social preferences. In the conceptual model of their study pro-socialness accounted for 35% of

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variance in later academic achievement, making it the only variable in the study that significantly influenced academic achievement. Early aggression had a null effect on later academic achievement. Caprara et al. uncovered this pair of counterintuitive relationships between early aggression and later academic achievement. The multiple methods of collection of data regarding the variables and the various sources (the participants themselves, peers and teachers) this was collected from added to the reliability of the researchers' study. The researchers indicated that there is need for further work to be done to explore the components of pro-socialness that underlie enhanced socio-cognitive functioning. The Caprara et al. study helped to gain insight into the dynamics of achieving individuals and what contributes to achievement.

While Caprara et al. asked about early academic achievement, other researchers such as Peterson (2000) explored later academic achievement. Peterson asked if there exists a consistency in the mode of achievement. To explore this, a follow-up study on a group of achievers and underachievers four years after their high school graduation was conducted. They found that mode of achievement tended to be consistent – underachievers continued to be underachievers and achievers continued to be achievers. However, what is of particular relevance was that they attributed their findings to habits of either achievement or underachievement. They did not indicate what these habits are, but indicated that if the habits of the individuals stayed consistent, so too will the mode of achievement of the individual.

The relationship of various achievement-relevant personality measures with the broader personality landscape was explored in the research work of Briley, Domiteaux, and Tucker-Drob (2014). In their study 1214 participants were measured on 36 different achievement related measures and a measure of the Big Five personality traits or five factor model (conscientiousness, agreeableness, neuroticism, openness and extraversion). The results

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of their research supported the discriminant and convergent validity of five latent dimensions, namely self-doubt, effort, intellectual investment, performance and mastery. It was found that neuroticism, openness to experience and conscientiousness had the most consistent associations with the 36 achievement related measures. The aim of Briley et al.'s (2014) research was to explore achievement-relevant measures (APMs). Their work emphasised how intricate the interaction between APMs and the broader personality landscape is. This stressed that achievement is a many sided coin with various factors to consider and explore.

Within the current study the construct of a top achiever was operationalised according to the description of De Villiers (2009), since the measurement used within the study was developed by De Villiers. Within the current study a top achiever was operationalised as “someone who continuously exceeds the expectation that is normally met by successful people”, and a successful person in turn is “someone who performs a task in such a way that the outcome matches the expectation and regularly exceeds the expectation” (De Villiers, 2009, p.10). These above mentioned findings contributed to the understanding of achievement in various ways and contributed to the identification of areas that need further exploration. The area of research the current study was interested in is the area where behavioural habits and achievement come together.

### **2.3 Habits and achievement**

Although the research on the construct of habit and the construct of achievement is quite extensive as discussed in the previous sections, the research on the habits of achievers is quite minimal. The current study searched for insight on behavioural habits and achievement; more specifically research on the habits of achievers. The work of Covey (1989) highlights seven repeated behaviours that improve the effectiveness of an individual; specific behaviours such as being proactive and synergizing. Covey's approach to effectiveness is

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centred on principles and character, prompting individuals to start the change in their behaviour from within. He described an individual's character as being a collection of his/her habits and that habits in turn consist of knowledge, skill and desire. This allows an individual to know what to do, how to do it and have the desire to do it. The seven habits Covey identified aim to help an individual to move from dependence to independence and ultimately interdependence. Covey's work was, however, done in the domain of business and self-help, contributing more towards popular psychology, more specifically popular psychology guiding towards effectiveness. Covey's work emphasised that there is a shift in research towards enhancement and improvement; a shift towards wanting to understand how effective individuals behave – a shift towards the questions asked by the current study.

Insights with regards to behavioural habits and achievement were also found in the work of Duhigg (2012). Here habits were explained as a choice in behaviour that you think about at first and then stop thinking about, but continue doing – the behaviour becomes automatic. The brain does not have to partake in the decision making so actively; it can focus on other matters as well. Duhigg (2012) explained habit formation via the “habit loop” (p. 19) – a process consisting of a cue acting as the trigger, the routine behaviour, and then a reward for this, making the behaviour a habit. The focus of his research fell on habits in an individual's personal sphere and in social and organisational contexts. Duhigg emphasised how the right habits are critical for success in doing a specific task in a specific environment. This emphasised the pivotal part habits can play in the process of achievement, tying together behavioural habits and achievement.

Duhigg (2012) also addressed the process of habit formation from an intricate neurological perspective by explaining findings by researchers such as Bayley, Franscino, and Squire (2005), but this, however, falls outside the scope of the current study. Duhigg's

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work helped describe what we know about habits and habit formation thus far. Duhigg's work echoed some of the other studies discussed here (Aarts & Dijksterhuis, 2000; Neal et al., 2006; Verplanken, 2006).

Some studies focused on specific types of habits that could be related to achievement, for example the study habits and academic work habits of students. In the exploration of these specific habits of students these studies indicated that students' study and academic work habits are related to academic success (Cappella, Wagner, & Kusmierz, 1982; Chiu, 1997; Gadzella & Williamson, 1984; Keith, Reimers, Fehrmann, Pottebaum, & Aubey, 1986; Nixon & Frost, 1990; Pintrich, Smith, Garcia, & McKeachie, 1993; Schutz, 1997). The specific study and work habits that were addressed within these studies were homework completion, seeking assistance with work, preparedness for class, and effort and persistence in academic tasks. Even though these studies helped to gain some insight into the study and work habits of students this research searched for a better more current measurement of the habits of achievers. The studies mentioned earlier in the paragraph explored specific habits and then indicated that these specific study and work habits are related to academic success. The current research study set out to explore the question from the other direction; to first establish if an individual is an achiever and to then explore which habits the achievers display to which intensity. The mentioned studies contributed to the specific understanding of academic habits, but the current study searched for a broader exploration of habits. The current study wished to explore habits that were not just specifically related to academic work and studying, but rather diverse habits expressed in a broader domain of life; habits such as the habit of responsiveness and not to the narrowed specific level of preparedness for class, for example.

De Villiers (2009) argued that if the behavioural habits of top achievers in a specific environment are identified, these can be used as a benchmark to test the propensity of

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prospective individuals to also achieve in the same environment. These findings led to the development of the Shadowmatch system. This system allows researchers to further explore the understanding of habits and achievement. The understanding of habits has come a long way since James (1890) identified his principles of psychology. Likewise the understanding of achievement has come a long way since Maslow (1943) placed achievement in the second highest level of his hierarchy of needs. The foundation has been laid for the question of the habits of achievers to be explored.

From this review it was seen that there are not many studies exploring the habits of achievers specifically; although the foundation has been laid, the question has not previously been asked from the angle of the current study. The findings of the current study can contribute to expand the limited understanding of the habits of achievers. This review shows the many insights on habits and the many insights on achievers, but most importantly it shows the limited insight into the habits of achievers. Although the field of psychology has a understanding of habits and an understanding of achievement, the combined construct of the habits of achievers has room for exploration. The question of the habits of achievers has not been thoroughly addressed within the exploration of these constructs.

### **2.4 Theoretical framework**

As discussed in the literature review, the construct of habits and the construct of achievement have been explored in various studies within psychology. The research specifically addressing the habits of achievers is, however, not that extensive. The current study aimed to explore this topic to help expand the understanding of the habits of achievers. Together with the literature review this section summarises the theoretical models, principles or practices that are relevant to the research. In light of the review of the literature on the constructs of habits and achievement, the theoretical framework of the study falls within the

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paradigm of positive psychology. The aim of this paradigm is to catalyze change in the field of psychology, away from a constant pre-occupation with preventing and fixing the worst aspects of life and towards focusing on developing the best qualities in individuals (Seligman, 2002). The research question for the current study arose from within this paradigm; the study asked the question of how do the habits of achievers from diverse work environments compare. The current study focuses on developing the best qualities of individuals by exploring the behavioural patterns of achievers; the individuals who act on their need for achievement (McClelland et al., 1953). Positive psychology is centered on positive subject experiences in the past and present and constructive cognitions regarding the future. It is centered on positive personal traits and civic virtues and institutions that move individuals to become better (Seligman, 2002). Seligman is viewed as the father of contemporary positive psychology, but research that dates as far back as the work of James (1890) is viewed as part of the founding of positive psychology; the paradigm in which the theoretical framework is rooted.

Within the paradigm of positive psychology the field of positive organisational behaviour (POB) exists; this field emphasizes the need for more focused research and theory building together with effective application of positive behaviour of employees in organisations (Bakker & Schaufeli, 2008). The research question of the current study originated within this field; the study specifically aimed to create more focused research and theory building for application of positive behaviour within organisations. The current study thus fell within the field of positive organisational behaviour within the overall paradigm of positive psychology.

Within the paradigm of positive psychology Seligman (1991) developed the theory of “The Good Life”. This theory emphasizes how an individual is optimally engaged with

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his/her primary activities if his/her strengths match the task. If the individual is confident in what is being done, a higher sense of engagement is experienced. By employing actions they are good at, they enhance their lives. The Shadowmatch system seeks exactly this; to identify an environment in which an individual's natural behaviour patterns or habits can allow them to flourish and become a top achiever. Positive psychology conducts research to improve human life and functioning. The current study was part of the research with this aim in mind.

The paradigm of positive psychology has not specifically addressed the question of the habits of achievers. The theoretical framework of the study found its point of departure in Seligman's (1991) positive psychology theory of "The Good Life", but this theory does not specifically describe the constructs that were researched in the current study. The measurement instrument of the study aligned with this theory. Therefore, the operationalisation of the constructs of the study was driven by the understanding of these constructs within the measurement instrument used in the study. By aligning the theoretical framework of the study with the measurement instrument's understanding of the construct, the researcher assured that the construct that is measured operationally is the same as the theoretical understanding of the construct. The theory of "The Good Life" was applicable to the current study, but the constructs were operationalised in accordance with the theoretical understanding of the measurement instrument.

The construct of a habit was operationalised according to the description of De Villiers (2009, p.18): a habit is "an action that repeats itself with no conscious planning". As discussed in the literature review, this view echos the aspects of habits and habit formation explored by other researchers (Aarts & Dijksterhuis, 2000; Andrews, 1903; Lally et al., 2010; Neal et al., 2006; Verplanken, 2006). This specific description is the description of a habit used within the current study; any time the construct is explored in the study it specifically

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refers to this understanding of what a habit is. This operationalisation of the construct aligns the theoretical framework of the study with the measurement instrument's understanding of the construct to help align the practical and theoretical understanding of habits within the study.

The intensity with which the behavioural patterns are expressed in the current study is explored by means of De Villiers' (2009) range of categories as explained in the literature review. De Villiers' measurement categorised the frequency and intensity with which a behaviour is expressed within a range of behavioural categories, ranging from planned behaviour to radical habits. This understanding of the categories of behavioural pattern intensities form part of the theoretical framework's understanding of the constructs of the study.

The research question of the current study stems from the need expressed by Gillham and Seligman (1999, p. 169): "A desperate need of a positive psychology that provides us with information about how to build virtues like creativity, hope, future-mindedness, interpersonal skill, moral judgment, forgiveness, *humor [sic]* and courage and how to enhance happiness and life satisfaction". Psychology is at a point where the focus of research can shift from preventing and treating psychopathologies to exploring the drive towards life satisfaction and enhancing human strengths. The research problem of the current study stemmed from the motivation to gain insight into which attributes and actions in life lead to individuals achieving in their particular environments, and to gain accurate substantiated psychological research on the behavioural patterns or habits of top achievers.

### 2.5 Chapter summary

Chapter 2 indicated that various questions have been asked about the nature of habits and various questions have been asked about achievement, but the questions of the habits of

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achievers still need further exploration by researchers. If there is better understanding of the behaviour of top achievers, there can be better understanding of which behaviours to develop to help individuals achieve and reach success. This better understanding can drive the need to raise our automatic behaviour to a conscious level of exploration, in order to build a better understanding of behaviour. The need for further research with regards to the constructs of habits and achievement can be addressed and integrated into the broader understanding of these constructs. In light of the review of the literature on the constructs of habits and achievement, the theoretical framework of the study fell within the paradigm of positive psychology. The chapter indicated how the research question stemmed from the paradigm of positive psychology within the field of psychology.

In Chapter 3 an overview of the research process of the current study is given. Aspects such as the research question, aims and objectives, research design, sampling procedures, measurement instrument, data collection process, data analysis process and ethical considerations are discussed.

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### CHAPTER 3: RESEARCH METHODOLOGY

Chapter 3 provides an overview of the research process involved within the current study. The chapter addresses the research question, aims and objectives and research design. This is followed by a description of the sampling procedures, the measurement instrument and the data collection and analysis process. Thereafter, an outline of the ethical considerations of the current study is given.

#### 3.1 Research question, aims and objectives

As introduced in Chapter 1, the current study sets out to compare the behavioural patterns of top achievers from diverse work environments, as measured by the Shadowmatch worksheet, to explore the possibility of similarity between the behavioural patterns, and if similarities are present, the extent of these similarities. The study therefore posed the following research question: How do the behavioural patterns (habits) of top achievers from diverse work environments compare?

The aim of the study was to determine how the behavioural patterns (habits) of top achievers from various work environments compare. To meet the aim of the proposed study the following objectives were set out:

- To explore the extent to which top achievers' behavioural patterns or habits, as identified by the Shadowmatch worksheet, occur across different work environments.
- To identify the behavioural patterns or habits which are expressed the most intensely by top achievers across different work environments.
- To identify the behavioural patterns or habits which are expressed the least intensely by top achievers across different work environments

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### 3.2 Research design

The research design of the study was a non-experimental descriptive research design that used existing data as data source. Gravetter and Forzano (2012) describe a non-experimental design as a design that compares different groups of scores to attempt to demonstrate the relationship between variables without explaining the relationship. A descriptive design is described as a design that involves measuring variables as they naturally exist to create a description of individual variables as they exist within a specific group. The current study did not involve data from live participants; the study involved analysing existing data from the Shadowmatch system's database. The non-experimental descriptive research design allowed the researcher to connect the conceptual research problem to the empirical research. This gave the researcher the means to explore the research question within the theoretical framework of the current study.

The behavioural patterns or habits of top achievers were compared across different workplace benchmarks. The selected benchmarks of top achievers were compared with regards to the 19 behavioural patterns or habits as identified and defined by the Shadowmatch system. These habits were: propensity to own, propensity to hand-off, to simplify, resilience, propensity to change, frustration handling, team inclination, individual inclination, self motivation, routine, problem solving, responsiveness, innovation, people positive behaviour, discipline, conflict handling, altruism, self confidence and leadership. (see Appendix A for a definition of each habit). The benchmarks were selected from the existing Shadowmatch database, the source of data for the current study (Shadowmatch, 2015). As explained in Chapter 1 of this mini-dissertation, a Shadowmatch benchmark is created by the following process: The top performers doing a specific job in a specific environment are identified by the performance evaluation system in the work environment. Each top achiever completes the Shadowmatch worksheet individually and the results are combined into one graph. This

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graph becomes the benchmark for the habits necessary to do the job successfully in that specific environment. Other individuals are then matched against this benchmark to indicate the individual's propensity to becoming successful at doing the same job in that specific working environment (De Villiers, 2009). This process was followed in various work environments and captured on the Shadowmatch system, thereby creating the collection of benchmarks from which the researcher selected the benchmarks used in the current study.

### **3.3 Sampling procedure and criteria**

The sampling method of the current study was stratified random sampling. This method involves selecting equal sized random samples from the variety of identifiable subgroups that exist within a population (Gravetter & Forzano, 2012). This was done to ensure a representative sample of the population by sufficiently representing each subgroup in the sample.

Top achievers that make up the benchmark for a specific environment are individuals who all fill exactly the same position (for example Office Managers) in the same company. The top achievers are identified by the company or environment's performance scoring system. The company therefore first had to implement a performance scoring system to assess the individuals in the environment before the Shadowmatch system could be applied. Only after the performance scoring system had been in place for the required period of eight months, could the individuals be assessed to determine who the top achievers were.

The benchmark information was used; the benchmark is the combined profile of behavioural patterns or habits of the top achievers in a specific role in the specific workplace. The overall population for the proposed study was therefore the collection of benchmarks on the Shadowmatch database. During the sampling process of the current study there were 12 307 benchmarks on the Shadowmatch system (Shadowmatch, 2015). The Shadowmatch

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system calculates the benchmark stability factor for each benchmark. This is an internal reliability and validity check to gather whether the top achievers included in the benchmark are congruent enough with the behavioural patterns assessed. This benchmark stability factor indicates the similarity of the behavioural patterns of the top achievers in that specific benchmark. If this factor is lower than 75%, the benchmark cannot be used as a valid and stable benchmark and was not included in the study. The population of benchmarks that were included in the study were therefore only the valid benchmarks with a stability factor of higher than 75%.

The different types of top achievers or benchmarks that could be compared were subject to whether the benchmark had been created on the system or not. Although habits are part of any individual in any type of environment, there are more benchmarks on the Shadowmatch system that fall within the business work environment than other types of environments. The reason for this is that Shadowmatch was administered within the business environment to a larger extent than non-business type environments. The population of the current study consists of the valid benchmarks on the system. This population was therefore influenced by the extent of the application of the Shadowmatch system; the system had to have been applied in an environment to shape the population of the current study. The nature of the population determined the nature of the strata within the population; therefore, the strata of the current study fell within the business work environment.

Within this population of valid benchmarks there exist various subgroups/strata of benchmark types. The nature of the specific role of the top achievers within an environment defines how the groups are formed. The initial 10 different benchmark types/strata that were considered were:

- Administration role

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- Manager
- Finance role
- Executive committee member
- Consultant
- CA clerk
- Sales role
- IT role
- Customer service role
- Engineer

These 10 benchmark types were the strata originally set out to sample from, but during the sampling process some of the identified strata could no longer be included in the sampling process. The strata that fell away were Consultant and CA clerk because there was not a sufficient number of benchmarks that adhered to the criteria of a stability factor of 75% or higher within these strata. The eight strata that were therefore included in the study were:

- Administration role
- Manager
- Finance role
- Executive committee member
- Sales role
- IT role
- Customer service role
- Engineer

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Within each of the eight strata the benchmarks were randomly sampled by the following procedure: The researcher manually searched the database of the system for benchmarks that adhered to the 75% or higher stability factor. These valid benchmarks were then listed and grouped into the various strata by assessing the role the top achievers fulfil within the environment. This list of valid benchmarks made up the population of the current study, grouped into the various strata.

At this point it was established that the strata for the role of a CA clerk and Consultant could no longer form part of the sampling process, since there were not enough valid benchmarks within these categories. In order to have enough benchmarks for the statistical analysis, 12 benchmarks needed to be selected within each stratum. Twelve benchmarks were randomly selected from the list for each stratum as described by Gravetter and Forzano (2012) in their description of stratified random sampling. The process of random selection within the strata involved removing the specific names of the business environments from a spreadsheet listing all the benchmarks that meet the criteria as stated. From this list without specific names, 12 benchmarks were randomly selected. (Randomly here refers to using no specific pattern or method; the researcher just selected without knowing which business environment is being selected.) By randomly selecting the benchmarks from the system it eliminated bias with regards to other variables such as geographical location of business and business size. Benchmarks from small, medium and corporate businesses were represented.

For the purpose of this mini-dissertation the variable that defined the strata was the specific role the benchmark fulfils within the environment. It is possible to break the strata down into further more specific sub-strata based on other variables such as gender or company size. However, the variable of benchmark type was what was compared within the

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

current study, and the general benchmark type strata were sufficient for the purposes of this mini-dissertation.

The initial sampling was done on benchmark level as described previously in this section. However, for the purpose of the data analysis technique used in the current study, the raw scores of the top individuals within the benchmark needed to be considered individually. The reason for this is explained more comprehensively in Chapter 4, but in brief it is to restrict the statistical error of doing statistical analysis on scores that have already been combined and averaged by previous statistical processes. Instead of using the combined average benchmark score, the raw individual scores that make up the benchmark were used.

Therefore, for each stratum 40 individual scores were randomly sampled from the 12 sampled benchmarks within the group. The individual scores of the individuals within the 12 benchmarks were listed and from this list 40 scores were randomly selected as in accordance to Gravetter and Forzano's (2012) description of random sampling. (Randomly here refers to using no specific pattern or method; the researcher just selected without knowing which score was being selected). Although an equal number of benchmarks per group was sampled, namely 12 benchmarks, there was not an equal number of individual scores within these benchmarks. The reason for this is that there were different numbers of individuals per benchmark. To align with Gravetter and Forzano's requirements for stratified random sampling, there needed to be an equal number of research units in each group of the sample. Forty was the number of individual scores in the smallest group of 12 benchmarks, and to keep the number of research units per group equal, all other groups had to be minimized to 40.

The number of scores per benchmark type was still equal and more than the number of dependent variables in the study. The current study has 19 dependent variables. Chapter 4

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

explains why it is required that there are more research units in the smallest group than there are dependent variables. Thus, by using the individual scores the researcher can meet the assumptions of the statistical analysis techniques used in the current study. The section on the data collection process describes how the 40 individual scores were selected from the sampled benchmark data. Although the end scores that were used were individual scores, the main sampling was done at benchmark level where the benchmarks needed to meet the specific Shadowmatch criteria to be included in the sampling. From the randomly selected benchmarks, 40 individual scores were randomly selected.

### **3.4 Measurement instrument**

As previously mentioned, the measurement instrument used in the current study was the Shadowmatch worksheet. Shadowmatch is a patented software platform created in South Africa by Pieter de Villiers, the owner of De Villiers, Bester & Associates (DBA), the company that developed the Shadowmatch System. He is a South African researcher in the field of success, specifically the interaction between habits and success in the workplace. More than 20 years of research done by De Villiers lead to the development of the Shadowmatch worksheet and system. The measurement instrument was originally developed, standardised and validated in South Africa with South African individuals (De Villiers, 2009). The Shadowmatch system is currently also used in the United States of America, the United Kingdom and Australia, but only data collected in South Africa was used for the current study. The worksheet is available in English, Spanish and French. The data collected in the current study was collected with the original English version of the worksheet.

The Shadowmatch worksheet forms part of the larger Shadowmatch system that uses and analyses the results obtained from the worksheet in various ways. The instrument also finds the best match between the behavioural patterns or habits of an individual, the

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

environment where a task will be performed and the task/job to be done. The worksheet consists of 68 questions in an electronic worksheet survey format that asks the participant how he/she will behave in different day-to-day situations. The results of the worksheet identify the individual's behavioural patterns and to what extent these patterns are expressed by the individual. The results of the worksheet are communicated in a graph that indicates the extent to which the various habits measured by the worksheet are established or not. A score out of 100 indicates the intensity of each measured habit. This score is depicted on a graph ranging from planned behaviour (low intensity forced decisions) to radical behaviour (habitual naturally applied behaviour):

- Planned Behaviour – Needs effort and planning to behave this way (score > 0 to 20)
- Necessary Behaviour – Will behave this way only if necessary (score > 20 to 30)
- Contextual Habits – Can choose easily to behave this way (score > 30 to 50)
- Strong Habits – Strongly prefers to behave this way (score > 50 to 65)
- Radical Habits – Nearly always behaves this way (score > 65 to 100)

(De Villiers, 2009). An example of a results graph is shown in figure 3.1. This graph indicates the various habit categories.

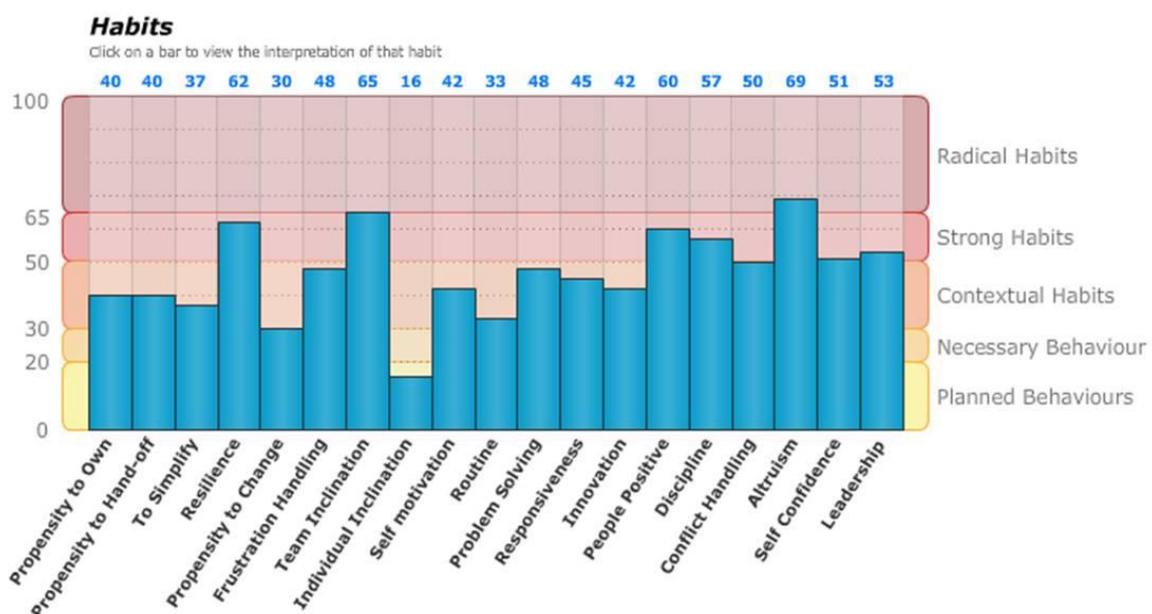


Figure 3.1: Example of the results graph of a Shadowmatch worksheet to indicate the habit categories

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The measurement is worksheet based in that it takes into account the actions of the individual whilst completing the measurement; whether the individual goes back and changes answers, how long it takes to answer and other answering characteristics. The manner in which the individual completes the task provides insight into the individual's habits, decision making and conceptual mental agility. The measure takes a different length of time for each individual, the duration of which forms part of the evaluation, varying anything from twenty minutes to two hours. The questions are objective and cannot be easily manipulated. The style of the measurement is of such a nature that one question can measure up to 15 of the constructs. The measurement style is not a linear style in which one question measures one specific construct, each question contributes to the measurement of various constructs to different degrees. (De Villiers, 2009). For an example of what a question looks like refer to appendix E.

### **3.4.1 Reliability and validity of the Shadowmatch worksheet**

The Center for Organizational Effectiveness at the Florida Institute of Technology in the USA prepared a report documenting the validation process of the Shadowmatch worksheet (De Villiers & Converse, 2014). This report addressed various aspects with regards to the reliability and validity of the Shadowmatch measure.

Test-retest reliability refers to the reliability that is established by correlating the scores obtained from two successive measurements of the same individuals (Gravetter & Forzano, 2012). The procedure for testing the construct validity of the Shadowmatch Worksheet involved investigating the convergent and discriminant validity of the Shadowmatch Worksheet habit measures. Each Shadowmatch variable was matched with a theoretically similar/convergent and a theoretically distinct/discriminant personality construct (De Villiers & Converse, 2014). One hundred and fifteen participants were recruited through

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Amazon's online crowd-sourcing tool named Mechanical Turk (M\*Turk). This tool allows individuals (M\*Turkers) from around the world to complete tasks and surveys for researchers and practitioners in exchange for monetary payment (Sprouse, 2011). These 115 participants completed the Shadowmatch worksheet, and a second measure consisting of 15 previously validated personality instruments from the public domain version of the NEO-PI-R (IPIP)3 was used (Goldberg, 1999). (The International Personality Item Pool (IPIP) is a free well-validated public domain personality assessment based on Costa and McCrae's (1992) NEO Personality Inventory.) All of these measures showed good reliability, with Cronbach's alphas ranging from .78 to .97 (Goldberg, 1999).

Each of these variables (with the exception of Conscientiousness) was measured with 10 items using 5-point scales asking participants how well the statement described them (1= very inaccurate, 5 = very accurate). Conscientiousness was measured using 60 items and the same 5-point scale. Each Shadowmatch Worksheet habit was linked to two personality measures, with one being theoretically related (convergent) and the other theoretically unrelated (discriminant). Appendix F shows the bivariate correlations' statistical significance of those relationships. Results demonstrated strong evidence of construct validity, as all of the habits had statistically significant relationships with their theoretically related constructs and non-significant relationships with their theoretically unrelated constructs (De Villiers & Converse, 2014).

### **3.5 Data collection**

The data collection procedure for the proposed study involved the researcher being granted access to the Shadowmatch database in accordance with the agreement with the creators and owners of the Shadowmatch Company (see Appendix B). The researcher has undergone training in the administration of the Shadowmatch system and functioning of the

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database (see Appendix D). The researcher did not need to actively administer the Shadowmatch worksheet as measurement instrument to participants. The worksheet was administered independently in various work environments and the results were captured on the Shadowmatch system's database. Each work environment that makes use of the Shadowmatch system has a trained administrator within the work environment that administers the system and the worksheet process. Once an individual within the work environment completes the worksheet sent electronically by the administrator, the results are automatically captured on the system. This initial completion of the worksheet was not the data collection process of the current study. To protect the identity of individuals that completed the worksheets the current study's researcher was not given information about the individual's workplace. The current study's data collection process involves the details of the process done by the researcher to collect data from the existing database. The existing data on the Shadowmatch system's database was accessed and the researcher identified the benchmarks, as explained in the section discussing the sampling process. The researcher then listed the system identity code for the sampled benchmarks for each stratum to give to a system developer to retrieve the data from the system.

To be included in the study a benchmark had to adhere to the Shadowmatch criteria for identifying top individuals. However, for the purpose of the statistical data analysis technique used in the current study, the results of the individuals within the benchmark needed to be considered individually. This was to restrict the statistical error of doing statistical analysis on scores that have already been combined and averaged by previous statistical processes; rather than using the combined average benchmark score, the raw individual scores that make up the benchmark were used. The results of analysis done with the raw individual scores could be a more accurate indication than analysis done with already averaged benchmark data. Another reason for using the raw individual scores instead of the

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combined results was to adhere to the assumptions of profile analysis with regards to sample size. The details of the latter are explained in Chapter 4.

The data that was collected from the system was the individual raw scores for the individuals in the 12 benchmarks sampled within each stratum. From this list of system identity codes of the sampled benchmarks a system developer exported the scores of the individuals within each benchmark into an excel spreadsheet. The system developer who retrieved the data from the system blind copied the results, meaning that the individual names and surnames were replaced with a generic identifier so that the researcher did not have contact with the individual's personal information. Although 12 benchmarks were sampled per stratum, there was not an equal number of individual scores per benchmark. The smallest number of individual scores in a stratum was 40. From the blind copied list of individuals in the 12 benchmarks per stratum, 40 individual scores were randomly selected per stratum. The reason for doing this was to assure that each stratum had an equal number of scores. The data from the excel spreadsheet was imported into IBM SPSS in order to complete the next part of the research study, the data analysis.

### **3.6 Data analysis**

The data analysis process that was administered in the current study firstly consisted of a descriptive statistical analysis of the variables – the 19 behavioural patterns measured by the Shadowmatch worksheet. According to Pallant (2013), descriptive statistics have various uses for a researcher. In the current study it was firstly used to describe the general characteristics of the sample of the study. Thereafter, it was used to verify if the variables violated any of the assumptions that underlie the statistical techniques that were used in the further analysis. The main statistical analysis technique that was used in the current study was profile analysis; therefore, the variables were checked with the underlying assumptions of

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profile analysis in mind. The possible issues with regards to the assumptions and limitation of profile analysis that were checked for were: unequal sample sizes and missing data, multivariate normality linearity, outliers, homogeneity of variance-covariance matrices, multicollinearity and singularity.

After the descriptive statistics the main method of statistical analysis was profile analysis, done in SPSS (Pallant, 2013). Profile analysis is the multivariate alternative to repeated measures ANOVA (analysis of variance), done in SPSS (Pallant, 2013). Profile analysis was the method of data analysis that allowed the researcher to analyse the 19 different behavioural pattern scores across the different groups/strata in the data, as indicated in the sampling process. Tabachnick and Fidell (2013) describe profile analysis as a special application of multivariate analysis of variance for cases with various dependent variables. Profile analysis was used to compare profiles of various groups measured on several different scales. In the current study, the groups were the eight groups of benchmark types and the scales were the 19 habits. The analysis asked whether different groups of top achievers had the same pattern of means for the range of habits. The three main questions asked by profile analysis were the following:

- Are the groups parallel between scores?
- Are the groups at equal levels across scores?
- Do the profiles exhibit flatness across scores?

If the null hypothesis was rejected for these questions, then there was a significant effect for the test concerning this aspect of profile analysis. Each aspect is addressed in Chapter 4. After the profile analysis, the required post-hoc tests were conducted to further pinpoint the results of profile analysis, as discussed in Chapter 4.

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### **3.7 Ethical considerations**

The General Ethical Guidelines for Health Researchers (Health Professions Council of South Africa, 2008) requires specific aspects to be taken into consideration to ensure that a research study is ethical. The current study used existing data already established on the Shadowmatch system. Therefore, the ethical principles that were taken into consideration were the principles concerning data usage, rather than those applicable when working with participants. Consent to use the data was given in the form of a signed contract agreement between the users of Shadowmatch and DBA, with a clause stating that DBA reserves the right to process data and data profiles captured by the system for development and research purposes (see Appendix C). The use of this data is in line with the agreement in place between the developers/owners of the Shadowmatch Company and the researcher (see Appendix B).

The researcher only started the research process once institutional approval was obtained from the relevant committees of the Department of Psychology at the University of Pretoria, as well as the Faculty of Humanities' Research and Ethics Committee. Permission to commence with the research was given by the latter committee on 25 June 2015. The record keeping of the obtained data will be in line with the requirements of the Psychology Department at the University of Pretoria. All data will be stored at the University of Pretoria for the duration of 15 years under strict security measures.

### **3.8 Chapter summary**

The current study was a non-experimental descriptive research study that explored how the behavioural patterns (habits) of top achievers from diverse work environments compare. The measurement instrument that was used was the Shadowmatch worksheet. The Shadowmatch system database therefore formed the source of data for the current study.

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Stratified random sampling was used to sample twelve benchmarks from each stratum from this database. The data was exported and analysed by descriptive statistical analysis and profile analysis. Chapter 5 presents the results of this data analysis.

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### CHAPTER 4: RESULTS

The previous chapter discussed the details of the research methods used by the researcher, how the data for data analysis was obtained and the details of the data analysis techniques that were used in the current study. In this chapter the results of the data analysis are reported. Firstly, the results of the descriptive statistical analysis are reported for each of the 19 habits explored within the current study. The descriptive statistics addressed the characteristics of the study's sample and the assumptions required for profile analysis. Thereafter, the results of the profile analysis are communicated. The profile analysis compared the profiles of the eight groups of different top achievers with regards to the 19 habits measured by Shadowmatch. Finally, the results of the post-hoc comparisons of the results are reported. The post-hoc tests allowed the researcher to further explore the results of the profile analysis.

#### **4.1 Descriptive statistics: general characteristics of variables**

The general descriptive statistics of the sample of the current study are reported in table 4.1. The 19 dependent variables or habits are listed with a minimum, maximum, mean, standard deviation, skewness and kurtosis value. The sample consisted of a total of 320 individual scores. The habit of responsiveness had the highest mean of 55.78, whilst the habit of individual inclination had the lowest mean of 28.66. Variables such as gender, race and age fall outside the scope of the current study's research question and were not captured or reported on.



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The next part of this section reports on the characteristics of each habit individually. The mean score of each habit is described according to the Shadowmatch range of habit intensities, as outlined in figure 3.1 in Chapter 3.

To assess the univariate normality of the distribution of scores a Kolmogorov-Smirnov test was performed. The result is reported in table 4.2. The significance value of the Kolmogorov-Smirnov statistic for all 19 dependent variables was significant,  $p \leq .005$ . This suggests violation of the assumption of normality. However, Field (2013) indicates that a problem with significance tests such as the Kolmogorov-Smirnov test is that the test is based on null hypothesis significance testing which may lead to the test being significant in large samples even for small unimportant effects. Field advises to not pay too much attention to a significant value for a Kolmogorov-Smirnov test in a large sample such as the sample of the current study. Therefore, the significant value of the Kolmogorov-Smirnov test for these variables could be disregarded. The results of the researcher's further exploration of the normality of the distribution are reported individually for each variable in the next section of this chapter.

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**Table 4.2: Univariate test of normality of the 19 habits**

<b>Tests of Normality</b>			
	Kolmogorov-Smirnov <sup>a</sup>		
	Statistic	df	Sig.
Propensity to own	.083	320	.000
Propensity to hand-off	.089	320	.000
To simplify	.078	320	.000
Resilience	.093	320	.000
Propensity to change	.088	320	.000
Frustration handling	.063	320	.004
Team inclination	.069	320	.001
Individual inclination	.076	320	.000
Self motivation	.082	320	.000
Routine	.061	320	.005
Problem solving	.060	320	.008
Responsiveness	.093	320	.000
Innovation	.068	320	.001
People positive	.063	320	.004
Discipline	.068	320	.001
Conflict handling	.059	320	.009
Altruism	.067	320	.002
Self confidence	.060	320	.007
Leadership	.054	320	.027
a. Lilliefors Significance Correction			

**4.1.1 Propensity to own**

Table 4.3 reports the descriptive statistics of the habit of propensity to own. The mean for the habit of propensity to own was 47.62 (SD = 6.13). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 32, with a minimum score of 31 and a maximum score of 63. The distribution of this variable showed a negative skewness of -.105 and a negative kurtosis of -.186.

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**Table 4.3: Descriptive statistics of the habit of propensity to own**

Descriptives			Statistic	Std. Error
Propensity to Own	Mean		47.62	.343
	95% Confidence Interval for Mean	Lower Bound	46.94	
		Upper Bound	48.29	
	5% Trimmed Mean		47.66	
	Median		47.00	
	Variance		37.597	
	Std. Deviation		6.132	
	Minimum		31	
	Maximum		63	
	Range		32	
	Interquartile Range		8	
	Skewness		-.105	.136
	Kurtosis		-.186	.272

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.1) and Q-Q plot (figure 4.2) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.3) and difference between mean and 5% trimmed mean (0.04) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

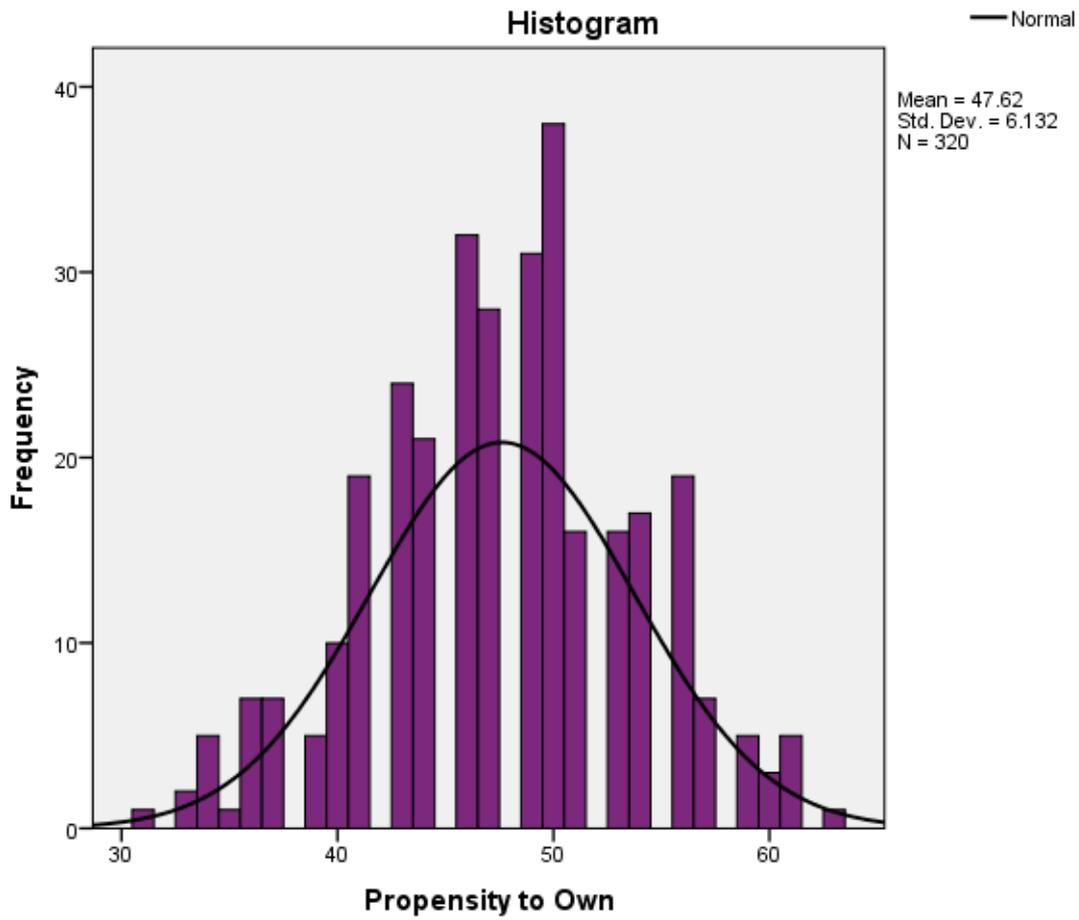


Figure 4.1: Histogram of the habit of propensity to own

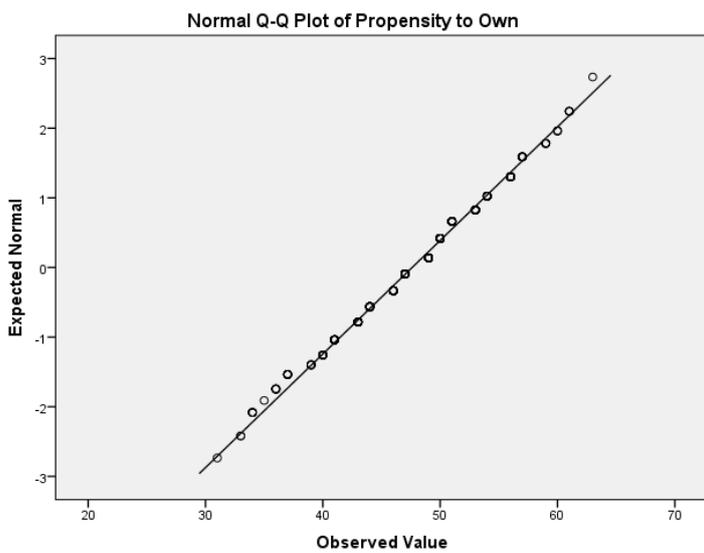


Figure 4.2: Normal Q-Q plot of the habit of propensity to own

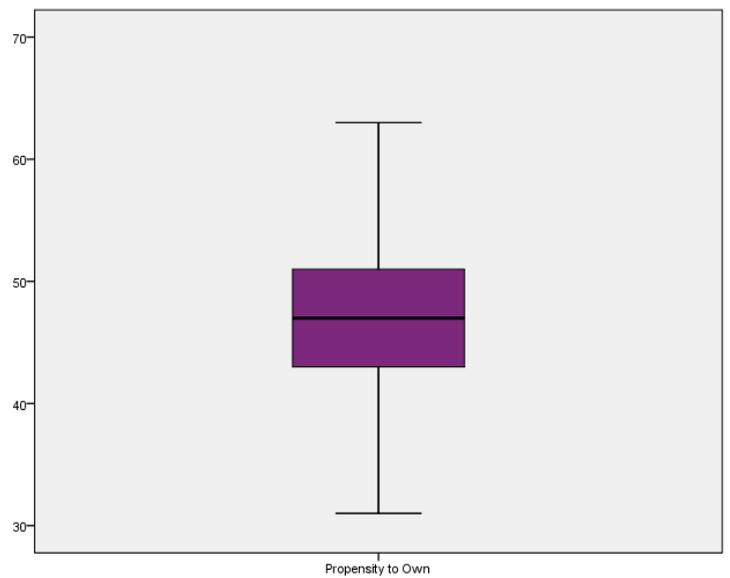


Figure 4.3: Boxplot of the habit of propensity to own

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**4.1.2 Propensity to hand-off**

Table 4.4 reports the descriptive statistics of the habit of propensity to hand-off. The mean for the habit of propensity to hand-off was 30.05 (SD = 6.17). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 35, with a minimum score of 14 and a maximum score of 49. The distribution of this variable showed a positive skewness of .294 and a negative kurtosis of -.087.

**Table 4.4: Descriptive statistics of the habit of propensity to hand-off**

<b>Descriptives</b>				
		Statistic	Std. Error	
Propensity to Hand-off	Mean	30.05	.345	
	95% Confidence Interval for Mean	Lower Bound	29.37	
		Upper Bound	30.73	
	5% Trimmed Mean	29.91		
	Median	29.00		
	Variance	38.114		
	Std. Deviation	6.174		
	Minimum	14		
	Maximum	49		
	Range	35		
	Interquartile Range	10		
	Skewness	.294	.136	
	Kurtosis	-.082	.272	

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.4) and Q-Q plot (figure 4.5) of the variable suggested no major violation of normality. There was a slight deviation at the upper end of the normal Q-Q plot, but this taken into consideration with the histogram's shape was not major enough to violate the assumption of normality. Especially in a large sample such as this where Field (2013) stresses that the researcher

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should not worry too much about the normality of the distribution taken into consideration the central limit theorem. The central limit theorem states that as sample size gets bigger, the assumption of normality matters less; the sampling distribution will be normal regardless of the data of the population (Field, 2013). Therefore, it is suggested that the assumption of univariate normality was not violated.

The boxplot (figure 4.6) and difference between mean and 5% trimmed mean (0.14) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

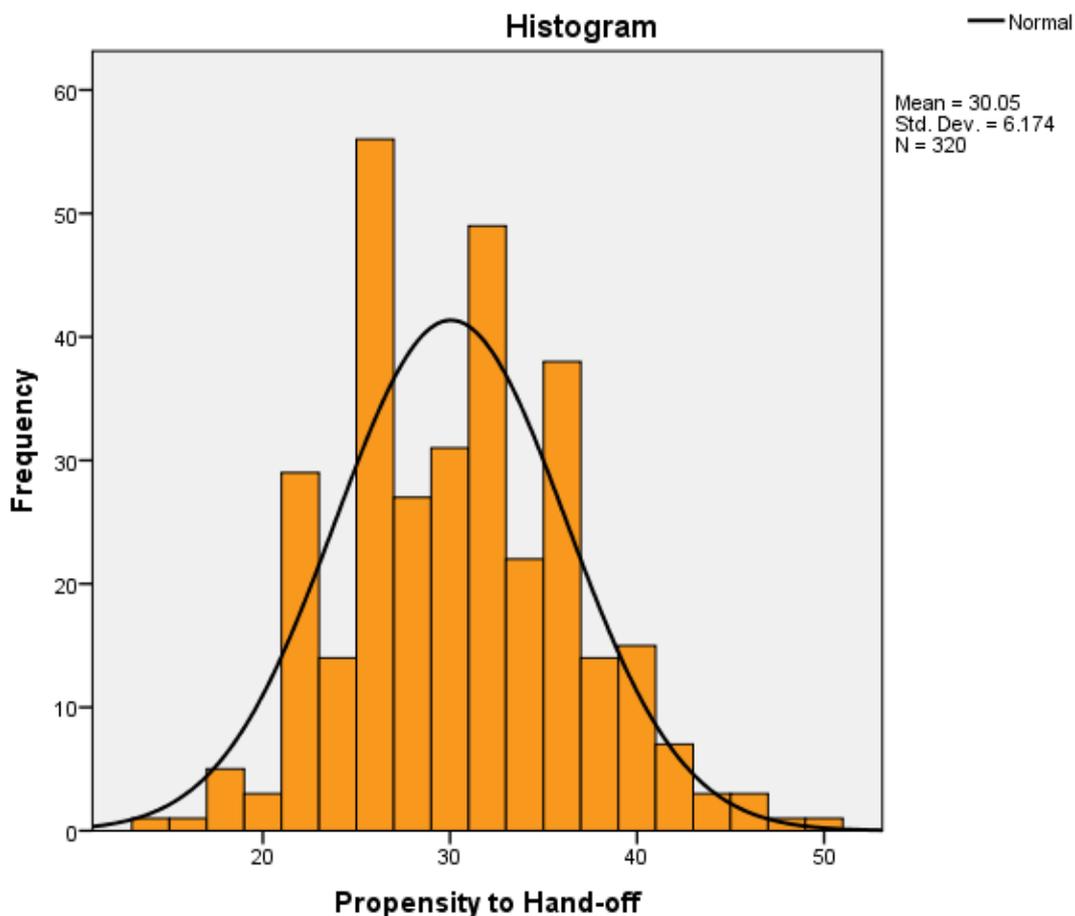


Figure 4.4: Histogram of the habit of Propensity to hand-off

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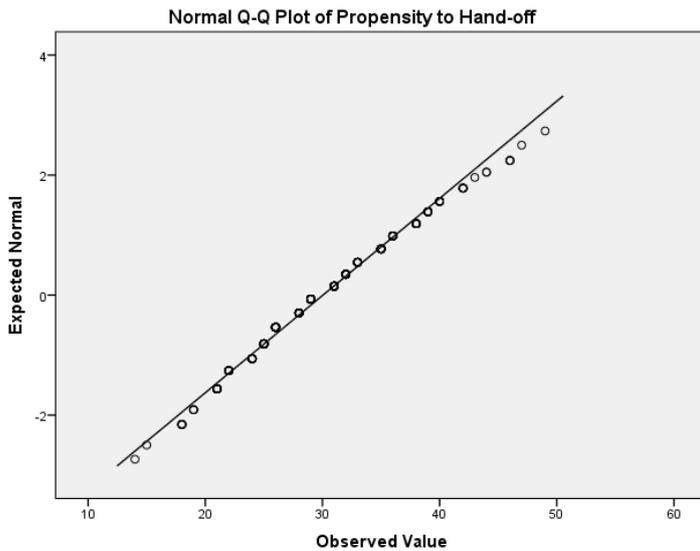


Figure 4.5: Normal Q-Q plot of the habit of propensity to hand-off

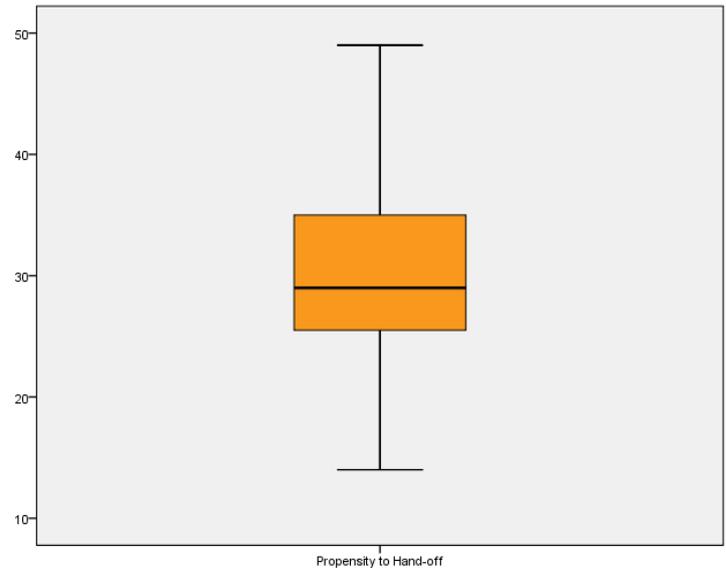


Figure 4.6: Boxplot of the habit of propensity to hand-off

### 4.1.3 To simplify

Table 4.5 reports the descriptive statistics of the habit of simplification. The mean for the habit of simplification was 49.61 (SD = 9.35). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 46, with a minimum score of 26 and a maximum score of 72. The distribution of this variable showed a negative skewness of  $-.241$  and a negative kurtosis of  $-.137$ .

Table 4.5: Descriptive statistics of the habit of simplification

Descriptives				
			Statistic	Std. Error
To Simplify	Mean		49.61	.523
	95% Confidence Interval for Mean	Lower Bound	48.58	
		Upper Bound	50.63	
	5% Trimmed Mean		49.77	
	Median		51.00	
	Variance		87.462	
	Std. Deviation		9.352	
	Minimum		26	
	Maximum		72	
	Range		46	
	Interquartile Range		12	
	Skewness		-.241	.136
	Kurtosis		-.137	.272

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.7) and Q-Q plot (figure 4.8) of the variable suggested no major violation of normality. There was a slight deviation at the lower end of the normal Q-Q plot, but this taken into consideration with the histogram's shape was not major enough to violate the assumption of normality. Especially in a large sample such as this where Field (2013) stresses that the researcher should not worry too much about the normality of the distribution taken into consideration the central limit theorem. The central limit theorem states that as sample size gets bigger, the assumption of normality matters less; the sampling distribution will be normal regardless of the data of the population (Field, 2013). Therefore, it is suggested that the assumption of univariate normality was not violated.

The boxplot (figure 4.9) and difference between mean and 5% trimmed mean (0.16) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

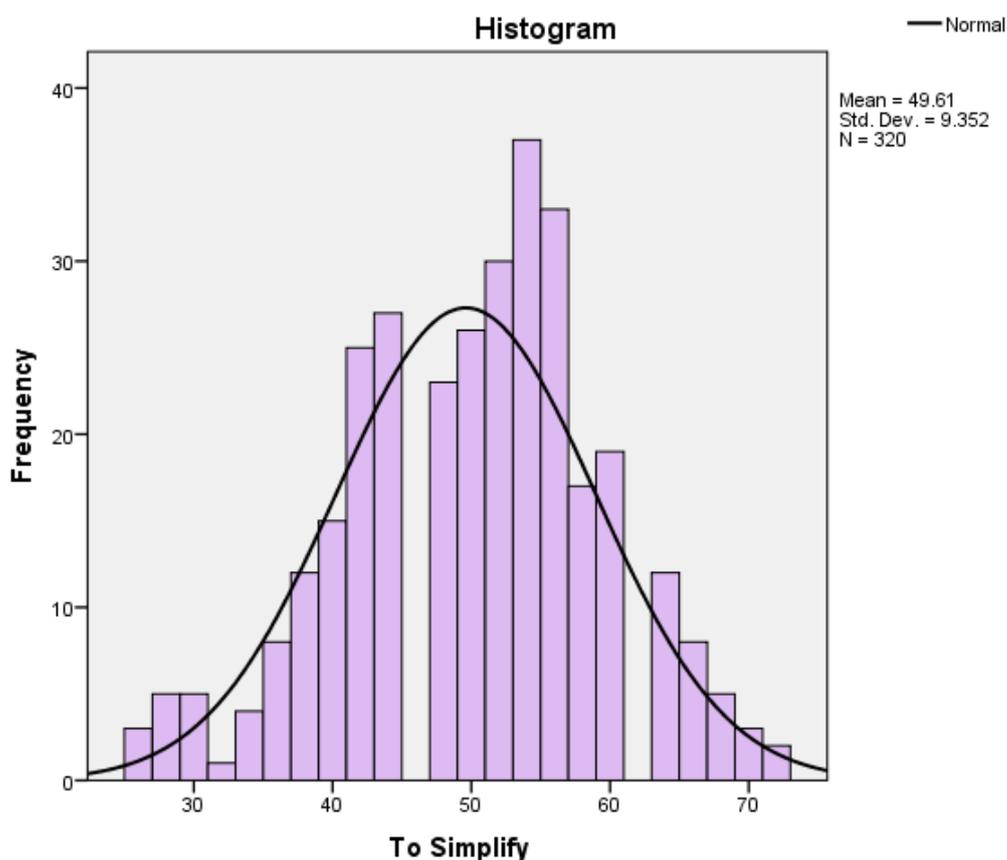


Figure 4.7: Histogram of the habit of simplification

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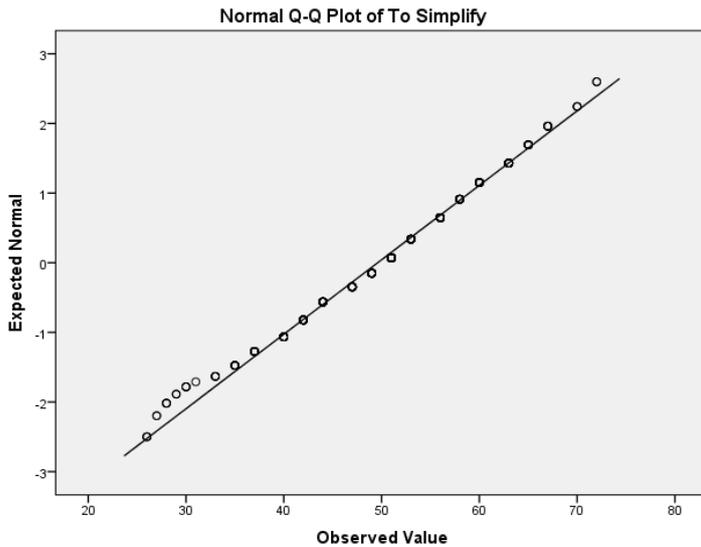


Figure 4.8: Normal Q-Q plot off the habit of simplification

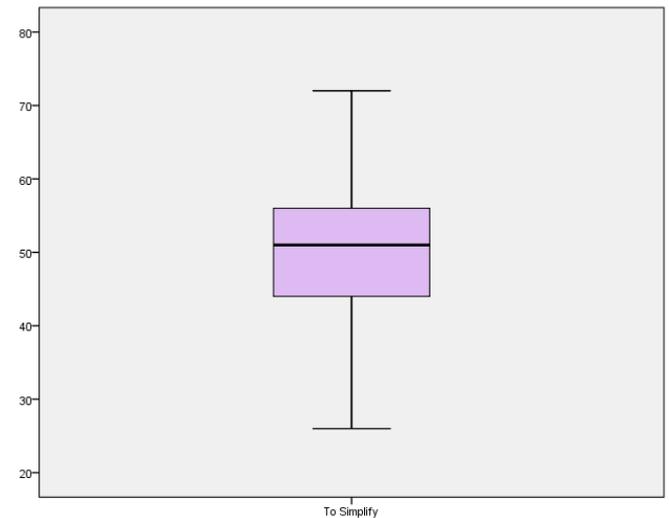


Figure 4.9: Boxplot of the habit of simplification

#### 4.1.4 Resilience

Table 4.6 reports the descriptive statistics of the habit of resilience. The mean for the habit of resilience was 51.66 (SD = 9.08). This mean falls within the category of strong habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 45, with a minimum score of 30 and a maximum score of 75. The distribution of this variable showed a negative skewness of  $-.085$  and a negative kurtosis of  $-.377$ .

Table 4.6: Descriptive statistics of the habit of resilience

Descriptives				
		Statistic	Std. Error	
Resilience	Mean	51.66	.508	
	95% Confidence Interval for Mean	Lower Bound	50.66	
		Upper Bound	52.66	
	5% Trimmed Mean	51.69		
	Median	52.00		
	Variance	82.519		
	Std. Deviation	9.084		
	Minimum	30		
	Maximum	75		
	Range	45		
	Interquartile Range	13		
	Skewness	-.085	.136	
	Kurtosis	-.377	.272	

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.10 – appendix H) and Q-Q plot (figure 4.11 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.12 – appendix H) and difference between mean and 5% trimmed mean (0.03) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

The histogram, normal Q-Q plot and boxplot of the first few variables were shown within Chapter 4. Since there was no deviation in the histogram, normal Q-Q plot and boxplot of the variable of resilience, these figures were included in appendix H. The same was done for the remainder of Chapter 4 where no deviations were shown for these aspects of the descriptive statistics.

### **4.1.5 Propensity to change**

Table 4.7 reports the descriptive statistics of the habit of propensity to change. The mean for the habit of propensity to change was 37.00 (SD = 9.35). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 44, with a minimum score of 15 and a maximum score of 59. The distribution of this variable showed a positive skewness of .016 and a negative kurtosis of -.451.

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**Table 4.7: Descriptive statistics of the habit of propensity to change**

<b>Descriptives</b>				
		Statistic	Std. Error	
Propensity to Change	Mean	37.00	.522	
	95% Confidence Interval for Mean	Lower Bound	35.97	
		Upper Bound	38.02	
	5% Trimmed Mean	36.99		
	Median	39.00		
	Variance	87.320		
	Std. Deviation	9.345		
	Minimum	15		
	Maximum	59		
	Range	44		
	Interquartile Range	12		
	Skewness	.016	.136	
	Kurtosis	-.451	.272	

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.13 – appendix H) and Q-Q plot (figure 4.14 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.15 – appendix H) and difference between mean and 5% trimmed mean (0.01) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

#### **4.1.6 Frustration handling**

Table 4.8 reports the descriptive statistics of the habit of frustration handling. The mean for the habit of frustration handling was 45.29 (SD = 9.01). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 47, with a minimum score of 21 and a maximum score of 68.

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The distribution of this variable showed a positive skewness of .038 and a negative kurtosis of -.308.

**Table 4.8: Descriptive statistics of the habit of frustration handling**

Descriptives				
		Statistic	Std. Error	
Frustration Handling	Mean		45.29	.504
	95% Confidence Interval for Mean	Lower Bound	44.30	
		Upper Bound	46.28	
	5% Trimmed Mean		45.29	
	Median		45.00	
	Variance		81.241	
	Std. Deviation		9.013	
	Minimum		21	
	Maximum		68	
	Range		47	
	Interquartile Range		13	
	Skewness		.038	.136
	Kurtosis		-.308	.272

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.16 – appendix H) and Q-Q plot (figure 4.17 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.18 – appendix H) and difference between mean and 5% trimmed mean (0.00) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

#### 4.1.7 Team inclination

Table 4.9 reports the descriptive statistics of the habit of team inclination. The mean for the habit of team inclination was 47.45 (SD = 9.35). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range

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of the 320 scores was 44, with a minimum score of 27 and a maximum score of 71. The distribution of this variable showed a positive skewness of .226 and a negative kurtosis of -.453.

**Table 4.9: Descriptive statistics of the habit of team inclination**

Descriptives				
		Statistic	Std. Error	
Team Inclination	Mean		47.45	.523
	95% Confidence Interval for Mean	Lower Bound	46.42	
		Upper Bound	48.48	
	5% Trimmed Mean		47.28	
	Median		47.50	
	Variance		87.446	
	Std. Deviation		9.351	
	Minimum		27	
	Maximum		71	
	Range		44	
	Interquartile Range		13	
	Skewness		.226	.136
	Kurtosis		-.453	.272

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.19) and Q-Q plot (figure 4.20) of the variable suggested no major violation of normality. There was a slight deviation at the lower end of the normal Q-Q plot, but this taken into consideration with the histogram's shape was not major enough to violate the assumption of normality. Especially in a large sample such as this where Field (2013) stresses that the researcher should not worry too much about the normality of the distribution taken into consideration the central limit theorem. The central limit theorem states that as sample size gets bigger, the assumption of normality matters less; the sampling distribution will be normal regardless of the data of the population (Field, 2013). Therefore, it is suggested that the assumption of univariate normality was not violated.

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The boxplot (figure 4.21) and difference between mean and 5% trimmed mean (0.17) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

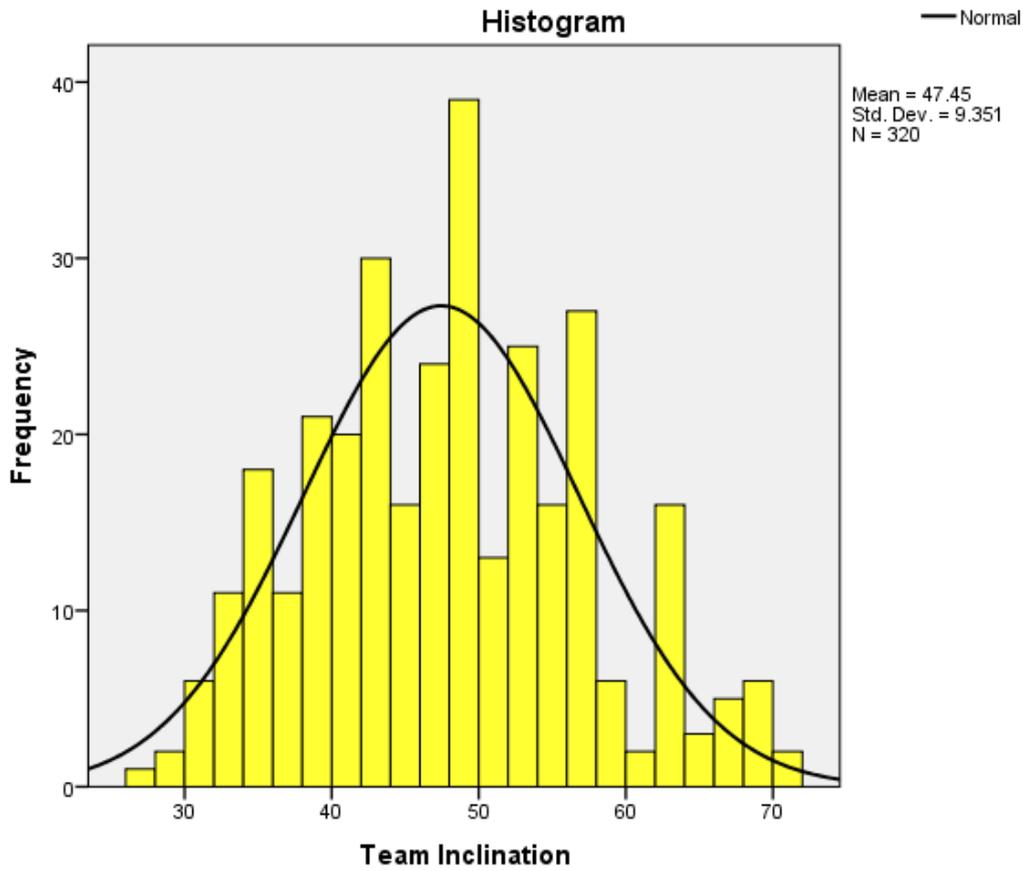


Figure 4.19: Histogram of the habit of team inclination

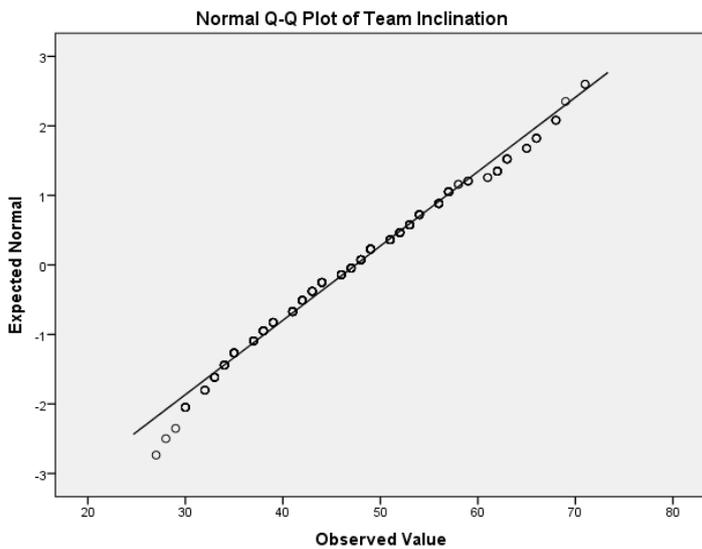


Figure 4.20: Normal Q-Q plot of the habit of team inclination

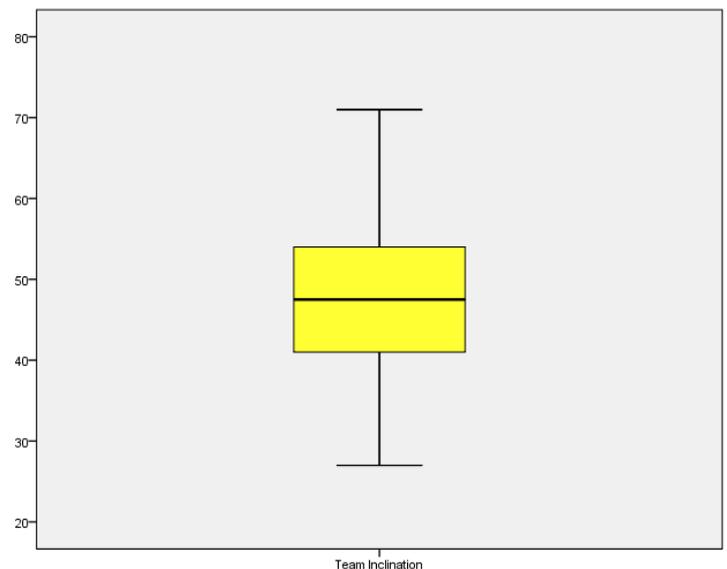


Figure 4.21: Boxplot of the habit of team inclination

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**4.1.8 Individual inclination**

Table 4.10 reports the descriptive statistics of the habit of individual inclination. The mean for the habit of individual inclination was 28.66 (SD = 7.03). This mean falls within the category of necessary behaviour in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 33, with a minimum score of 12 and a maximum score of 45. The distribution of this variable showed a negative skewness of -.028 and a negative kurtosis of -.490.

**Table 4.10: Descriptive statistics of the habit of individual inclination**

<b>Descriptives</b>				
		Statistic	Std. Error	
Individual Inclination	Mean	28.66	.393	
	95% Confidence Interval for Mean	Lower Bound	27.88	
		Upper Bound	29.43	
	5% Trimmed Mean	28.68		
	Median	29.00		
	Variance	49.374		
	Std. Deviation	7.027		
	Minimum	12		
	Maximum	45		
	Range	33		
	Interquartile Range	9		
	Skewness	-.028	.136	
	Kurtosis	-.490	.272	

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.22 – appendix H) and Q-Q plot (figure 4.23 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

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The boxplot (figure 4.24 – appendix H) and difference between mean and 5% trimmed mean (0.02) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.9 Self motivation

Table 4.11 reports the descriptive statistics of the habit of self motivation. The mean for the habit of self motivation was 43.84 (SD = 7.76). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 40, with a minimum score of 22 and a maximum score of 62. The distribution of this variable showed a negative skewness of -.147 and a negative kurtosis of -.421.

**Table 4.11: Descriptive statistics of the habit of self motivation**

Descriptives				
		Statistic	Std. Error	
Self motivation	Mean	43.84	.434	
	95% Confidence Interval for Mean	Lower Bound	42.98	
		Upper Bound	44.69	
	5% Trimmed Mean	43.89		
	Median	44.00		
	Variance	60.268		
	Std. Deviation	7.763		
	Minimum	22		
	Maximum	62		
	Range	40		
	Interquartile Range	11		
	Skewness	-.147	.136	
	Kurtosis	-.421	.272	

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.25 – appendix H) and Q-Q plot (figure 4.26 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

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The boxplot (figure 4.27 – appendix H) and difference between mean and 5% trimmed mean (0.05) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.10 Routine

Table 4.12 reports the descriptive statistics of the habit of routine. The mean for the habit of routine was 38.57 (SD = 9.34). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 47, with a minimum score of 16 and a maximum score of 63. The distribution of this variable showed a positive skewness of .048 and a negative kurtosis of -.257.

**Table 4.12: Descriptive statistics of the habit of routine**

<b>Descriptives</b>				
		Statistic	Std. Error	
Routine	Mean	38.57	.522	
	95% Confidence Interval for Mean	Lower Bound	37.54	
		Upper Bound	39.60	
	5% Trimmed Mean	38.55		
	Median	39.00		
	Variance	87.274		
	Std. Deviation	9.342		
	Minimum	16		
	Maximum	63		
	Range	47		
	Interquartile Range	12		
	Skewness	.048	.136	
	Kurtosis	-.257	.272	

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.28 – appendix H) and Q-Q plot (figure 4.29 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

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The boxplot (figure 4.30 – appendix H) and difference between mean and 5% trimmed mean (0.02) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

#### 4.1.11 Problem solving

Table 4.13 reports the descriptive statistics of the habit of problem solving. The mean for the habit of problem solving was 49.88 (SD = 6.97). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 36, with a minimum score of 31 and a maximum score of 67. The distribution of this variable showed a negative skewness of -.229 and a negative kurtosis of -.286.

**Table 4.13: Descriptive statistics of the habit of problem solving**

Descriptives			Statistic	Std. Error
Problem Solving	Mean		49.88	.389
	95% Confidence Interval for Mean	Lower Bound	49.12	
		Upper Bound	50.65	
	5% Trimmed Mean		50.01	
	Median		50.00	
	Variance		48.523	
	Std. Deviation		6.966	
	Minimum		31	
	Maximum		67	
	Range		36	
	Interquartile Range		10	
	Skewness		-.229	.136
	Kurtosis		-.286	.272

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.31 –

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appendix H) and Q-Q plot (figure 4.32 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.33 – appendix H) and difference between mean and 5% trimmed mean (0.13) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

#### 4.1.12 Responsiveness

Table 4.14 reports the descriptive statistics of the habit of responsiveness. The mean for the habit of responsiveness was 55.78 (SD = 9.07). This mean falls within the category of strong habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 47, with a minimum score of 31 and a maximum score of 78. The distribution of this variable showed a negative skewness of -.361 and a negative kurtosis of -.215.

**Table 4.14: Descriptive statistics of the habit of responsiveness**

<b>Descriptives</b>				
		<b>Statistic</b>	<b>Std. Error</b>	
Responsiveness	Mean		55.78	.507
	95% Confidence Interval for Mean	Lower Bound	54.79	
		Upper Bound	56.78	
	5% Trimmed Mean		56.04	
	Median		56.00	
	Variance		82.207	
	Std. Deviation		9.067	
	Minimum		31	
	Maximum		78	
	Range		47	
	Interquartile Range		13	
	Skewness		-.361	.136
	Kurtosis		-.215	.272

To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.34 –

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appendix H) and Q-Q plot (figure 4.35 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.36 – appendix H) and difference between mean and 5% trimmed mean (0.26) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

#### 4.1.13 Innovation

Table 4.15 reports the descriptive statistics of the habit of innovation. The mean for the habit of innovation was 41.84 (SD = 9.48). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 48, with a minimum score of 17 and a maximum score of 65. The distribution of this variable showed a negative skewness of -.212 and a negative kurtosis of -.334.

**Table 4.15: Descriptive statistics of the habit of innovation**

Descriptives				
		Statistic	Std. Error	
Innovation	Mean	41.84	.530	
	95% Confidence Interval for Mean	Lower Bound	40.80	
		Upper Bound	42.89	
	5% Trimmed Mean	41.96		
	Median	42.00		
	Variance	89.813		
	Std. Deviation	9.477		
	Minimum	17		
	Maximum	65		
	Range	48		
	Interquartile Range	13		
	Skewness	-.212	.136	
	Kurtosis	-.334	.272	

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.37 – appendix H) and Q-Q plot (figure 4.38 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.39 – appendix H) and difference between mean and 5% trimmed mean (0.12) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.14 People positive

Table 4.16 reports the descriptive statistics of the habit of people positive behaviour. The mean for the habit of people positive behaviour was 45.31 (SD = 9.96). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 56, with a minimum score of 18 and a maximum score of 74. The distribution of this variable showed a positive skewness of .076 and a negative kurtosis of -.393.

**Table 4.16: Descriptive statistics of the habit of people positive behaviour**

Descriptives				
		Statistic	Std. Error	
People Positive	Mean		45.31	.557
	95% Confidence Interval for Mean	Lower Bound	44.21	
		Upper Bound	46.40	
	5% Trimmed Mean		45.30	
	Median		44.00	
	Variance		99.174	
	Std. Deviation		9.959	
	Minimum		18	
	Maximum		74	
	Range		56	
	Interquartile Range		16	
	Skewness		.076	.136
	Kurtosis		-.393	.272

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.40 – appendix H) and Q-Q plot (figure 4.41 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.42 – appendix H) and difference between mean and 5% trimmed mean (0.01) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.15 Discipline

Table 4.17 reports the descriptive statistics of the habit of discipline. The mean for the habit of discipline was 52.58 (SD = 7.67). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 39, with a minimum score of 33 and a maximum score of 72. The distribution of this variable showed a negative skewness of -.025 and a negative kurtosis of -.321.

**Table 4.17: Descriptive statistics of the habit of discipline**

Descriptives				
		Statistic	Std. Error	
Discipline	Mean	52.58	.429	
	95% Confidence Interval for Mean	Lower Bound	51.74	
		Upper Bound	53.42	
	5% Trimmed Mean	52.59		
	Median	53.00		
	Variance	58.790		
	Std. Deviation	7.667		
	Minimum	33		
	Maximum	72		
	Range	39		
	Interquartile Range	11		
	Skewness	-.025	.136	
	Kurtosis	-.321	.272	

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.43 – appendix H) and Q-Q plot (figure 4.44 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.45 – appendix H) and difference between mean and 5% trimmed mean (0.01) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.16 Conflict handling

Table 4.18 reports the descriptive statistics of the habit of conflict handling. The mean for the habit of conflict handling was 48.41 (SD = 10.33). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 53, with a minimum score of 21 and a maximum score of 74. The distribution of this variable showed a negative skewness of -.066 and a negative kurtosis of -.270.

**Table 4.18: Descriptive statistics of the habit of conflict handling**

Descriptives				
			Statistic	Std. Error
Conflict Handling	Mean		48.41	.577
	95% Confidence Interval for Mean	Lower Bound	47.27	
		Upper Bound	49.54	
	5% Trimmed Mean		48.46	
	Median		48.00	
	Variance		106.656	
	Std. Deviation		10.327	
	Minimum		21	
	Maximum		74	
	Range		53	
	Interquartile Range		14	
	Skewness		-.066	.136
	Kurtosis		-.270	.272

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.46 – appendix H) and Q-Q plot (figure 4.47 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.48 – appendix H) and difference between mean and 5% trimmed mean (0.05) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.17 Altruism

Table 4.19 reports the descriptive statistics of the habit of altruism. The mean for the habit of altruism was 43.98 (SD = 11.13). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 55, with a minimum score of 15 and a maximum score of 70. The distribution of this variable showed a positive skewness of .179 and a negative kurtosis of -.365.

**Table 4.19: Descriptive statistics of the habit of altruism**

Descriptives				
		Statistic	Std. Error	
Altruism	Mean		43.98	.622
	95% Confidence Interval for Mean	Lower Bound	42.76	
		Upper Bound	45.21	
	5% Trimmed Mean		43.87	
	Median		43.00	
	Variance		123.959	
	Std. Deviation		11.134	
	Minimum		15	
	Maximum		70	
	Range		55	
	Interquartile Range		15	
	Skewness		.179	.136
	Kurtosis		-.365	.272

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.49 – appendix H) and Q-Q plot (figure 4.50 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.51 – appendix H) and difference between mean and 5% trimmed mean (0.11) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.18 Self confidence

Table 4.20 reports the descriptive statistics of the habit of self confidence. The mean for the habit of self confidence was 51.98 (SD = 9.18). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 52, with a minimum score of 24 and a maximum score of 76. The distribution of this variable showed a negative skewness of -.105 and a negative kurtosis of -.355.

**Table 4.20: Descriptive statistics of the habit of self confidence**

Descriptives				
		Statistic	Std. Error	
Self Confidence	Mean		51.98	.513
	95% Confidence Interval for Mean	Lower Bound	50.98	
		Upper Bound	52.99	
	5% Trimmed Mean		52.02	
	Median		53.00	
	Variance		84.222	
	Std. Deviation		9.177	
	Minimum		24	
	Maximum		76	
	Range		52	
	Interquartile Range		14	
	Skewness		-.105	.136
	Kurtosis		-.355	.272

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.52 – appendix H) and Q-Q plot (figure 4.53 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.54 – appendix H) and difference between mean and 5% trimmed mean (0.04) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### 4.1.19 Leadership

Table 4.21 reports the descriptive statistics of the habit of leadership. The mean for the habit of leadership was 48.03 (SD = 5.79). This mean falls within the category of contextual habits in the Shadowmatch worksheet categories of habit intensities. The range of the 320 scores was 30, with a minimum score of 34 and a maximum score of 64. The distribution of this variable showed a negative skewness of -.019 and a negative kurtosis of -.327.

**Table 4.21: Descriptive statistics of the habit of leadership**

Descriptives				
			Statistic	Std. Error
Leadership	Mean		48.03	.324
	95% Confidence Interval for Mean	Lower Bound	47.40	
		Upper Bound	48.67	
	5% Trimmed Mean		48.05	
	Median		48.00	
	Variance		33.532	
	Std. Deviation		5.791	
	Minimum		34	
	Maximum		64	
	Range		30	
	Interquartile Range		8	
	Skewness		-.019	.136
	Kurtosis		-.327	.272

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To further assess the normality of the sampling distribution, other elements than the Kolmogorov-Smirnov statistic were taken into consideration; the histogram (figure 4.55 – appendix H) and Q-Q plot (figure 4.56 – appendix H) of the variable suggested no major violation of normality. Therefore, the assumption of univariate normality was not violated.

The boxplot (figure 4.57 – appendix H) and difference between mean and 5% trimmed mean (0.02) of this variable indicated that there were no major cases of outliers, thereby adhering to the assumption of no univariate outliers.

### **4.2 Descriptive statistics: assumption testing for profile analysis**

As mentioned in the introduction of this chapter, the second function of descriptive statistics entailed checking that the sample meets the assumptions of the statistical techniques that were used in the next phase of the analysis process. The possible issues with regards to the assumptions and limitation of profile analysis that were checked for were unequal sample sizes and missing data, multivariate normality linearity, outliers, homogeneity of variance-covariance matrices, multicollinearity and singularity.

#### **4.2.1 Assumption 1 – Unequal sample sizes and missing data**

The first assumption of profile analysis that was verified was unequal sample sizes and missing data. Tabachnick and Fidell (2013) emphasize that for consideration of power and evaluation of assumptions of homogeneity of variance-covariance matrices, there should be more research units in the smallest group than the number of dependent variables. Table 4.22 reports the sample size of each group. The sample consisted of 320 individual scores divided into eight equal groups of 40. There were 19 dependent variables in the current study and there were 40 scores in each group of the sample. The sample size was therefore sufficient for analysis in the current study. Tabachnick and Fidell (2013) repeatedly stress the

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importance of this possible limitation. The sample of the current study had more research units in the smallest group than number of dependent variables. Therefore, the sample size did not affect the power and homogeneity of variance-covariance matrices of the current study.

**Table 4.22: Sample size of benchmark groups**

<b>Between-Subjects Factors</b>		
		N
Benchmark type	Admin	40
	Customer Service	40
	Engineer	40
	Exco	40
	Finance	40
	IT	40
	Manager	40
	Sales	40

There were no missing values in the sample, thus the sample was made up of 320 valid individual scores as seen in table 4.23. The assumptions of profile analysis were not violated; the sample size and missing data did not pose a problem for the analysis process.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Table 4.23: Case processing summary of the 19 habits**

<b>Case Processing Summary</b>						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Propensity to Own	320	100.0%	0	0.0%	320	100.0%
Propensity to Hand-off	320	100.0%	0	0.0%	320	100.0%
To Simplify	320	100.0%	0	0.0%	320	100.0%
Resilience	320	100.0%	0	0.0%	320	100.0%
Propensity to Change	320	100.0%	0	0.0%	320	100.0%
Frustration Handling	320	100.0%	0	0.0%	320	100.0%
Team Inclination	320	100.0%	0	0.0%	320	100.0%
Individual Inclination	320	100.0%	0	0.0%	320	100.0%
Self motivation	320	100.0%	0	0.0%	320	100.0%
Routine	320	100.0%	0	0.0%	320	100.0%
Problem Solving	320	100.0%	0	0.0%	320	100.0%
Responsiveness	320	100.0%	0	0.0%	320	100.0%
Innovation	320	100.0%	0	0.0%	320	100.0%
People Positive	320	100.0%	0	0.0%	320	100.0%
Discipline	320	100.0%	0	0.0%	320	100.0%
Conflict Handling	320	100.0%	0	0.0%	320	100.0%
Altruism	320	100.0%	0	0.0%	320	100.0%
Self Confidence	320	100.0%	0	0.0%	320	100.0%
Leadership	320	100.0%	0	0.0%	320	100.0%

**4.2.2 Assumption 2 – Multivariate normality**

The second issue that was addressed was assessing the normality of the distribution of the sample. Tabachnick and Fidell (2013) indicate that profile analysis is as robust to violation of normality as other forms of MANOVA. Pallant (2013) explains this robustness; although the significance test of MANOVA and profile analysis is based on a multivariate normal distribution, it is in practise reasonably robust to modest violations of normality. The sample size was not small and unequal, and there were more cases in the smallest group than there were dependent variables; therefore, deviation from normality of sampling distributions was not expected. However, the researcher did still assess the univariate normality of the distribution. For assessing univariate normality the researcher reported the skewness, kurtosis, histogram and Q-Q plot of each dependent variable in the previous section of this

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

chapter. These results did not suggest any major violations of normality. The only violations of normality were modest violations, and profile analysis is robust enough for this. The slight deviations discussed in the previous sections of this chapter will not have much of an effect. Especially in a large sample such as this where Field (2013) stresses that the researcher should not worry too much about the normality of the distribution, taking into consideration the central limit theorem. The central limit theorem states that as sample size gets bigger, the assumption of normality matters less; the sampling distribution will be normal regardless of the data of the population (Field, 2013). Therefore, the assumption of univariate normality was met. Since there was no major violation of univariate the researcher could assume multivariate normality to the extent that it will not have a major effect on the outcome (Field, 2013). This assumption of univariate and multivariate normality of the sampling distribution of the current study was thus met.

### **4.2.3 Assumption 3 – Absence of outliers**

Profile analysis is quite sensitive to outliers within the distribution. To test for univariate outliers, the details of the distribution of each variable was explored by analysing the histogram, boxplot and difference between mean and 5% trimmed mean. As indicated in the previous section of this chapter, no significant outliers were found in this exploration. The assumption of no univariate outliers was met.

To test for multivariate outliers the Mahalanobis distance was assessed. To determine the Mahalanobis distance a regression of all 19 habits was done with the unique identifying number of each score as dependent variable; this is the technique described by Pallant (2013) to test for multivariate normality of a distribution. The residual statistics output of this is shown in table 4.24.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Table 4.24: Residual statistics of regression of the sample**

Residuals Statistics <sup>a</sup>					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	46.10	251.38	160.50	38.002	320
Std. Predicted Value	-3.010	2.391	.000	1.000	320
Standard Error of Predicted Value	13.247	31.135	21.540	2.995	320
Adjusted Predicted Value	42.87	261.85	160.41	38.259	320
Residual	-168.292	185.280	.000	84.355	320
Std. Residual	-1.935	2.130	.000	.970	320
Stud. Residual	-1.983	2.200	.000	1.001	320
Deleted Residual	-176.786	197.680	.088	89.924	320
Stud. Deleted Residual	-1.993	2.214	.001	1.003	320
Mahal. Distance	6.402	39.871	18.941	5.539	320
Cook's Distance	.000	.020	.003	.004	320
Centered Leverage Value	.020	.125	.059	.017	320

a. Dependent Variable: ID

As seen in table 4.24 the maximum of the Mahalanobis distance = 39.87. This was compared to the critical value as determined by the chi square table. The critical value was determined at 19 degrees of freedom (the number of dependent variables within the study) and alpha value of 0.001. The Chi Square critical value that was determined was 43.82. The maximum value for Mahalanobis distance was less than the critical value; therefore, it could safely be assumed that there are no substantial multivariate outliers.

The comparison of the Mahalanobis distance maximum confirmed that it could safely be assumed that there are no substantial multivariate outliers. Therefore, the assumption of no univariate or multivariate outliers was not violated.

#### 4.2.4 Assumption 4 - Homogeneity of variance-covariance matrices

According to Tabachnick and Fidell (2013), if sample sizes are equal then evaluation of homogeneity of variance-covariance matrices is not necessary. The sample sizes all consisted of 40 valid individual scores. The sample sizes were thus equal for all eight groups to be compared in profile analysis.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

Box's M test is the preliminary test of the homogeneity of the variance-covariance matrices. The results of this test are reported in table 4.25. However Tabachnick and Fidell (2013) stresses that this test is too sensitive and the significance can be ignored if there are equal sample sizes as in this sample's case. Therefore, there was no violation of the assumption of homogeneity of variance-covariance matrices.

**Table 4.25: Box's test of equality of covariance matrices**

<b>Box's Test of Equality of Covariance Matrices<sup>a</sup></b>	
Box's M	1696.283
F	1.021
df1	1330
df2	108569.581
Sig.	.290
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	
a. Design: Intercept + Benchmarktype Within Subjects Design: Habits	

### 4.2.5 Assumption 5 – Linearity

The assumption of linearity is that there is a straight-line relationship between variables (Tabachnick & Fidell, 2013). Testing of this assumption could be ignored since the sample size is large enough and the variables met the assumption of normality of distribution. The reporting of scatterplots for each relationship between the variables of the current study fell outside the scope of this mini-dissertation. There was no violation of the assumption of linearity.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

### **4.2.6 Assumption 6 – Absence of multicollinearity and singularity**

Singularity refers to when a variable is a combination of two or more other variables and is thus redundant (Tabachnick & Fidell, 2013). Multicollinearity exists when there is a strong correlation between two or more of the independent variables within a study. The research design of the current study consisted of 19 dependent variables, but only one independent variable. This independent variable was the benchmark type. Since the current study had only one independent variable, multicollinearity was not a threat; there could not exist a strong correlation between two or more independent variables since there was just one. Appendix I shows the correlation matrix of the dependent variables used in the profile analysis. The correlation matrix is two dimensional. Therefore, even though some of the correlations between the dependent variables are high, this does not necessarily imply multicollinearity. Therefore, there was no violation of the assumption of absence of multicollinearity and singularity.

The overall testing for violations of the assumptions of profile analysis suggested that the sample met the assumptions sufficiently to conduct profile analysis. The results of the profile analysis are reported in the next section of this chapter.

### **4.3 Profile analysis**

The main statistical analysis of the current study was profile analysis. The analysis asked whether different groups of top achievers had the same pattern of means for the range of habits. In Chapter 3 the following three main questions asked by profile analysis were discussed. Each aspect is addressed in the next section of this chapter:

- Are the groups parallel between scores?
- Are the groups at equal levels across scores?

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

- Do the profiles exhibit flatness across scores?

If the null hypothesis was rejected for these questions, then there was a significant effect for the test concerning this aspect of profile analysis.

### **4.3.1 Test of parallelism**

In profile analysis the test of parallelism is a multivariate test that evaluates the Wilk's Lambda value of the Habits\*BenchmarkType factor. This value is reported in table 4.28. The F-value at the specific hypothesis and error degrees of freedom was  $F(126, 1947.62) = 2.56$   $p < .001$ . The critical value of the F-score = 1.46. The F-value exceeded the critical value; therefore, there was a statistically significant effect for this test. The null hypothesis of parallelism was rejected; the eight profiles were not parallel.

This deviation from parallelism can be seen in figure 4.58 (p.85). This figure reports the profile plot of the marginal means of the habits of the various benchmark types.

Table 4.28: Multivariate tests of profile analysis

Multivariate Tests <sup>a</sup>									
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>d</sup>
Habits	Pillai's Trace	.956	358.813 <sup>b</sup>	18.000	295.000	.000	.956	6458.634	1.000
	Wilks' Lambda	.044	358.813 <sup>b</sup>	18.000	295.000	.000	.956	6458.634	1.000
	Hotelling's Trace	21.894	358.813 <sup>b</sup>	18.000	295.000	.000	.956	6458.634	1.000
	Roy's Largest Root	21.894	358.813 <sup>b</sup>	18.000	295.000	.000	.956	6458.634	1.000
Habits * Benchmarktype	Pillai's Trace	.895	2.451	126.000	2107.000	.000	.128	308.873	1.000
	Wilks' Lambda	.365	2.561	126.000	1947.617	.000	.134	301.240	1.000
	Hotelling's Trace	1.146	2.667	126.000	2053.000	.000	.141	336.012	1.000
	Roy's Largest Root	.499	8.343 <sup>c</sup>	18.000	301.000	.000	.333	150.175	1.000
a. Design: Intercept + Benchmarktype Within Subjects Design: Habits									
b. Exact statistic									
c. The statistic is an upper bound on F that yields a lower bound on the significance level.									
d. Computed using alpha = .05									

Table 4.27 reports the multivariate tests of profile analysis. The Wilk's Lambda value of the Habits\*BenchmarkType factor was the result the researcher was concerned with, as mentioned in the previous section.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**4.3.2 Test of difference among levels**

In profile analysis the test of difference among levels is a between subjects test that evaluates the Type III Sum of squares value of the Benchmark type factor. This value is reported in table 4.29. The F-value at the specific hypothesis and error degrees of freedom was  $F(7,312) = 5.165$   $p=0.001$ . The critical value of the f score = 3.58. The F-value exceeded the critical value; therefore, there was a statistically significant effect for this test. The null hypothesis of the levels test was rejected; there was difference in the levels of the eight profiles.

Table 4.26 (Appendix G) lists the marginal means of the habits for each group. This table clearly shows that these means differ. Figure 4.58 (p.85) shows this difference among levels visually.

**Table 4.29: Profile analysis tests of within-subjects effects**

Tests of Within-Subjects Effects									
Measure: MEASURE_1									
Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Habits	Sphericity Assumed	305267.565	18	16959.309	324.673	.000	.510	5844.115	1.000
	Greenhouse-Geisser	305267.565	6.043	50513.538	324.673	.000	.510	1962.091	1.000
	Huynh-Feldt	305267.565	6.314	48346.739	324.673	.000	.510	2050.028	1.000
	Lower-bound	305267.565	1.000	305267.565	324.673	.000	.510	324.673	1.000
Habits * Benchmarktype	Sphericity Assumed	32576.337	126	258.542	4.950	.000	.100	623.649	1.000
	Greenhouse-Geisser	32576.337	42.303	770.072	4.950	.000	.100	209.383	1.000
	Huynh-Feldt	32576.337	44.199	737.039	4.950	.000	.100	218.767	1.000
	Lower-bound	32576.337	7.000	4653.762	4.950	.000	.100	34.647	.997
Error(Habits)	Sphericity Assumed	293351.992	5616	52.235					
	Greenhouse-Geisser	293351.992	1885.504	155.583					
	Huynh-Feldt	293351.992	1970.008	148.909					
	Lower-bound	293351.992	312.000	940.231					

a. Computed using alpha = .05

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

Table 4.29 reports the profile analysis tests of within-subjects effect. The Type III Sum of squares value of the Benchmark type factor was the result the researcher was concerned with, as mentioned in the previous section.

### 4.3.3 Test of flatness

In the profile analysis of the current study the test of flatness was irrelevant because the hypothesis of parallelism was rejected. The question of flatness of combined profiles did not make sense because at least one of them was not flat. Therefore, there was a statistically significant effect for this test. The null hypothesis of the flatness test was rejected; the eight profiles were not flat. If this test was relevant the test would have reported on the Hotelling's trace value of the Habits factor reported in table 4.30. This table reports the profile analysis tests of between-subjects effects.

**Table 4.30: Profile analysis tests of between-subjects effects**

Tests of Between-Subjects Effects								
Measure: MEASURE_1								
Transformed Variable: Average								
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Intercept	12385549.516	1	12385549.516	33478.298	0.000	.991	33478.298	1.000
Benchmarktype	13375.832	7	1910.833	5.165	.000	.104	36.155	.998
Error	115426.758	312	369.958					

a. Computed using alpha = .05

### 4.3.4 Profile plot

Figure 4.58 (p.85) shows the main graph of the results of this profile analysis. The graph visually displays the comparison of the marginal means of the eight different benchmark types for each habit. Figure 4.58 is a profile plot; a profile plot is a line plot in which each point indicates the estimated marginal mean of a dependent variable. Each dependent variable or habit has an individual line in the profile plot.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

The profile plot is the most useful output of profile analysis. The effects of the three tests profile analysis tests for, are seen visually in the profile plot. The deviation from parallelism is seen where the groups are not parallel between scores, where the segment of one benchmark type's profile plot line crosses the segment of another benchmark type's profile plot line between the same two scores. The difference in levels is seen where the profile plot lines of the various benchmark types are unequal across scores. The deviation from flatness is seen where the profile plot lines of each benchmark type are not flat between scores. The visual display aided in understanding why, if there was deviation from parallelism, then flatness was irrelevant.

The significance of this visual report of the profile plot of the marginal means of the habits of the various benchmark types was confirmed statistically by the three tests of profile analysis. All three tests of profile analysis had a significant effect. Thus, variability was determined.

The variability among the mean scores for the eight different benchmark types for each habit is shown by the distribution of the means on the profile plot. By assessing both the profile plot and the list of the marginal means of the habits for each group listed in Table 4.26 (Appendix G) different groups of distributions were found. The eight different means for some habits were clustered quite closely together, whereas the eight different means for some other habits were spread out across a wider range. The habit means that were clustered quite closely together were: propensity to own, propensity to hand-off, frustration handling, discipline and leadership. The habit means that were spread out over a fairly wide range were: to simplify, propensity to change, team inclination, responsiveness and innovation. The distribution of the means for the other habit fell somewhere between these two options and could therefore not be specifically assigned to either of the options.

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The analysis of the profile plot helped to pinpoint the variability amongst the intensity with which each habit is expressed by the different groups. The next step was to pinpoint the variability in terms of the overall combined profile of each benchmark type. The next section addresses the further analysis of the data with the aim of determining where the variability determined by profile analysis lies, in terms of the comparison of the profiles of the eight different benchmark types.

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

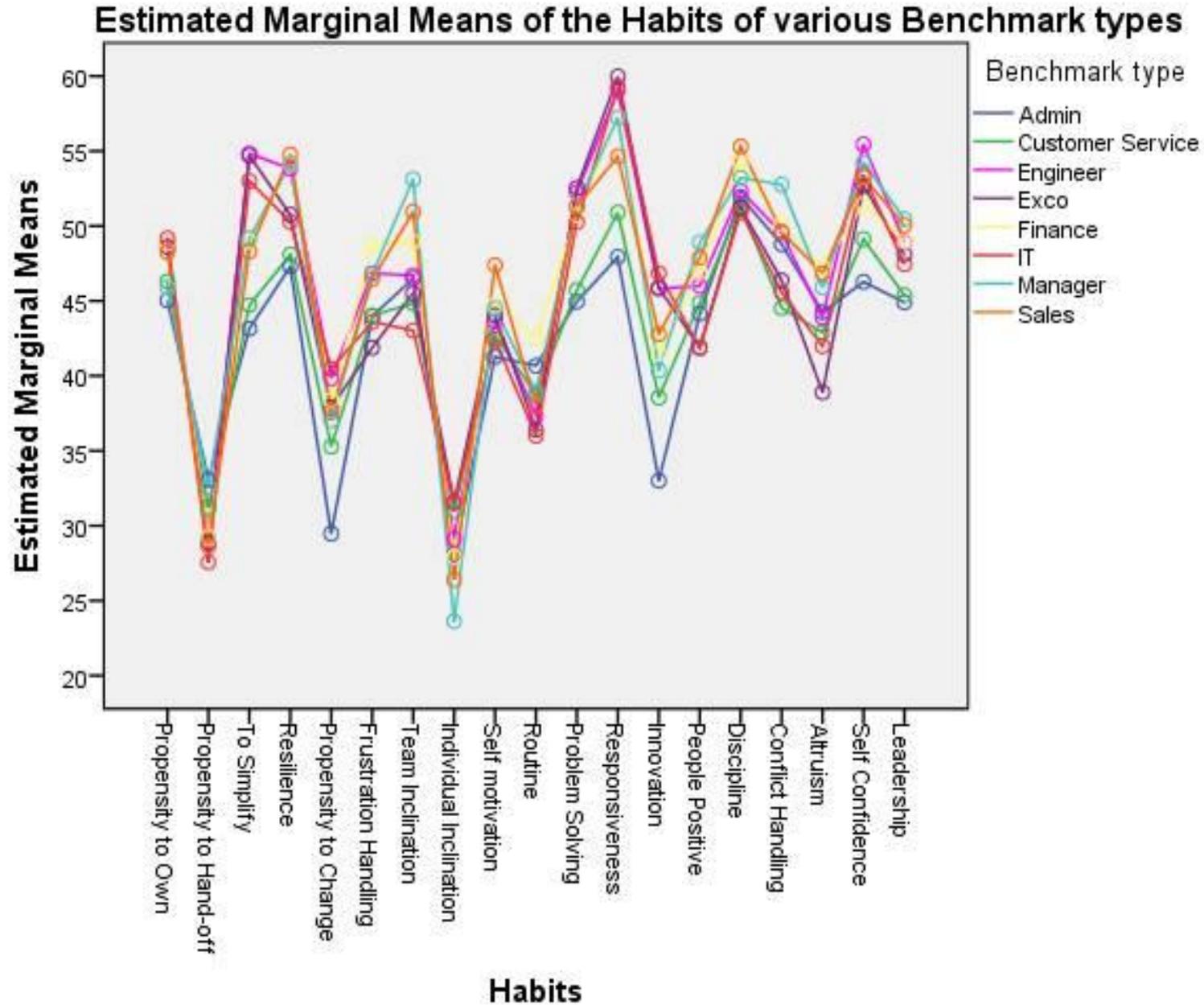


Figure 4.58: Profile plots of the marginal means of the habits of the various benchmark types

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

## 4.4 Post hoc tests

To pinpoint the variability of the significant main effects of profile analysis the main analysis was followed up by post hoc comparisons. Tabachnick and Fidell (2013) recommend the Scheffé test; it is the most conservative and most flexible of the popular methods of post hoc comparisons. There are no limits to the number of comparisons that can be performed with Scheffé adjustment. This was ideal for the current study with eight groups of benchmark types to be compared. The Scheffé test is significant at  $p \leq .05$ . Table 4.30 reports the results of the Scheffé test, comparing all benchmark types.

Table 4.31: Scheffé test comparing all benchmark types

Multiple Comparisons						
Measure: MEASURE_1						
Scheffé						
(I) Benchmark type		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Admin	Customer Service	-.82	.987	.998	-4.55	2.91
	Engineer	-4.15	.987	.015	-7.88	-.42
	Exco	-2.79	.987	.334	-6.52	.93
	Finance	-4.01	.987	.023	-7.74	-.29
	IT	-2.63	.987	.421	-6.36	1.10
	Manager	-3.97	.987	.026	-7.70	-.24
	Sales	-3.88	.987	.034	-7.60	-.15
Customer Service	Admin	.82	.987	.998	-2.91	4.55
	Engineer	-3.33	.987	.128	-7.05	.40
	Exco	-1.97	.987	.779	-5.70	1.75
	Finance	-3.19	.987	.168	-6.92	.54
	IT	-1.81	.987	.849	-5.54	1.92
	Manager	-3.15	.987	.182	-6.88	.58
	Sales	-3.06	.987	.218	-6.78	.67
Engineer	Admin	4.15	.987	.015	.42	7.88
	Customer Service	3.33	.987	.128	-.40	7.05
	Exco	1.35	.987	.966	-2.38	5.08
	Finance	.13	.987	1.000	-3.59	3.86
	IT	1.52	.987	.936	-2.21	5.25
	Manager	.18	.987	1.000	-3.55	3.90
	Sales	.27	.987	1.000	-3.46	4.00
Exco	Admin	2.79	.987	.334	-.93	6.52
	Customer Service	1.97	.987	.779	-1.75	5.70
	Engineer	-1.35	.987	.966	-5.08	2.38
	Finance	-1.22	.987	.981	-4.95	2.51
	IT	.17	.987	1.000	-3.56	3.89
	Manager	-1.18	.987	.985	-4.90	2.55
	Sales	-1.08	.987	.991	-4.81	2.65

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

Table 4.31 continued: Scheffé test comparing all benchmark types

Multiple Comparisons						
Measure: MEASURE_1						
Scheffe						
(I) Benchmark type		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Finance	Admin	4.01	.987	.023	.29	7.74
	Customer Service	3.19	.987	.168	-.54	6.92
	Engineer	-.13	.987	1.000	-3.86	3.59
	Exco	1.22	.987	.981	-2.51	4.95
	IT	1.38	.987	.961	-2.34	5.11
	Manager	.04	.987	1.000	-3.69	3.77
	Sales	.14	.987	1.000	-3.59	3.86
IT	Admin	2.63	.987	.421	-1.10	6.36
	Customer Service	1.81	.987	.849	-1.92	5.54
	Engineer	-1.52	.987	.936	-5.25	2.21
	Exco	-.17	.987	1.000	-3.89	3.56
	Finance	-1.38	.987	.961	-5.11	2.34
	Manager	-1.34	.987	.967	-5.07	2.39
	Sales	-1.25	.987	.978	-4.98	2.48
Manager	Admin	3.97	.987	.026	.24	7.70
	Customer Service	3.15	.987	.182	-.58	6.88
	Engineer	-.18	.987	1.000	-3.90	3.55
	Exco	1.18	.987	.985	-2.55	4.90
	Finance	-.04	.987	1.000	-3.77	3.69
	IT	1.34	.987	.967	-2.39	5.07
	Sales	.09	.987	1.000	-3.63	3.82
Sales	Admin	3.88	.987	.034	.15	7.60
	Customer Service	3.06	.987	.218	-.67	6.78
	Engineer	-.27	.987	1.000	-4.00	3.46
	Exco	1.08	.987	.991	-2.65	4.81
	Finance	-.14	.987	1.000	-3.86	3.59
	IT	1.25	.987	.978	-2.48	4.98
	Manager	-.09	.987	1.000	-3.82	3.63
Based on observed means.						
The error term is Mean Square(Error) = 19.471.						
*. The mean difference is significant at the .05 level.						

The Scheffé test was significant for the following four comparisons of benchmark type profiles: administrative role vs. engineer, finance role vs. administrative role, manager

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vs. administrative role and sales vs. administrative role. These specific profile comparisons can be seen in figures 4.59, 4.60, 4.61 and 4.62 and are profile plots comparing the two specific benchmark type plots in each significant comparison.

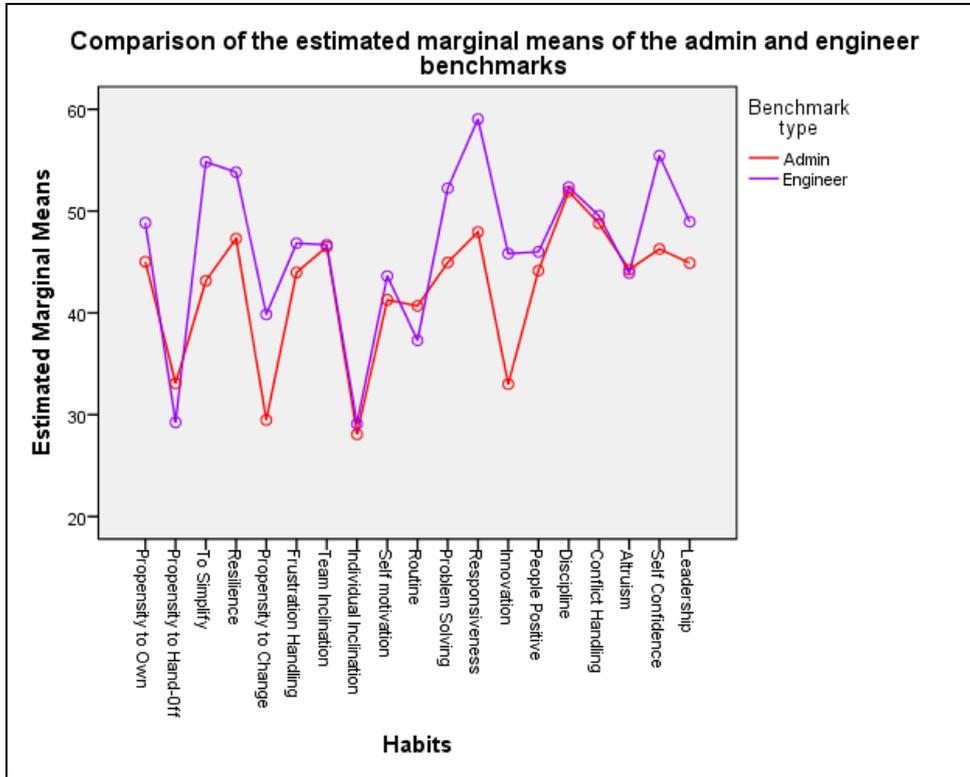


Figure 4.59: Profile plot of the comparison of the estimated marginal means of the admin and engineer benchmarks

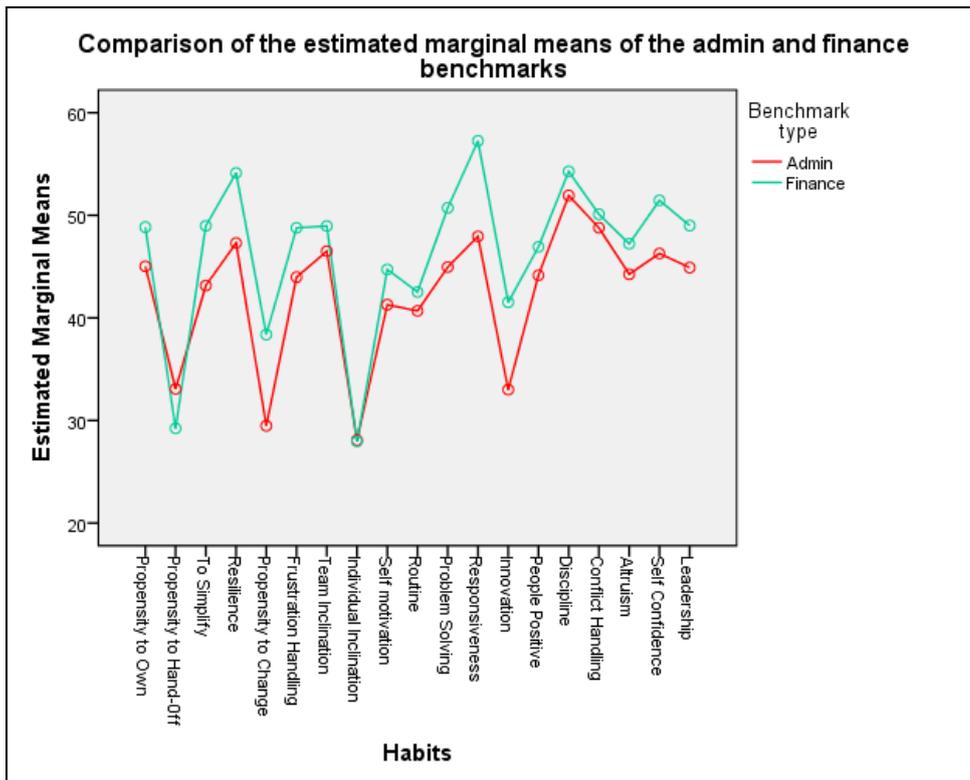


Figure 4.60: Profile plot of the comparison of the estimated marginal means of the admin and finance benchmarks

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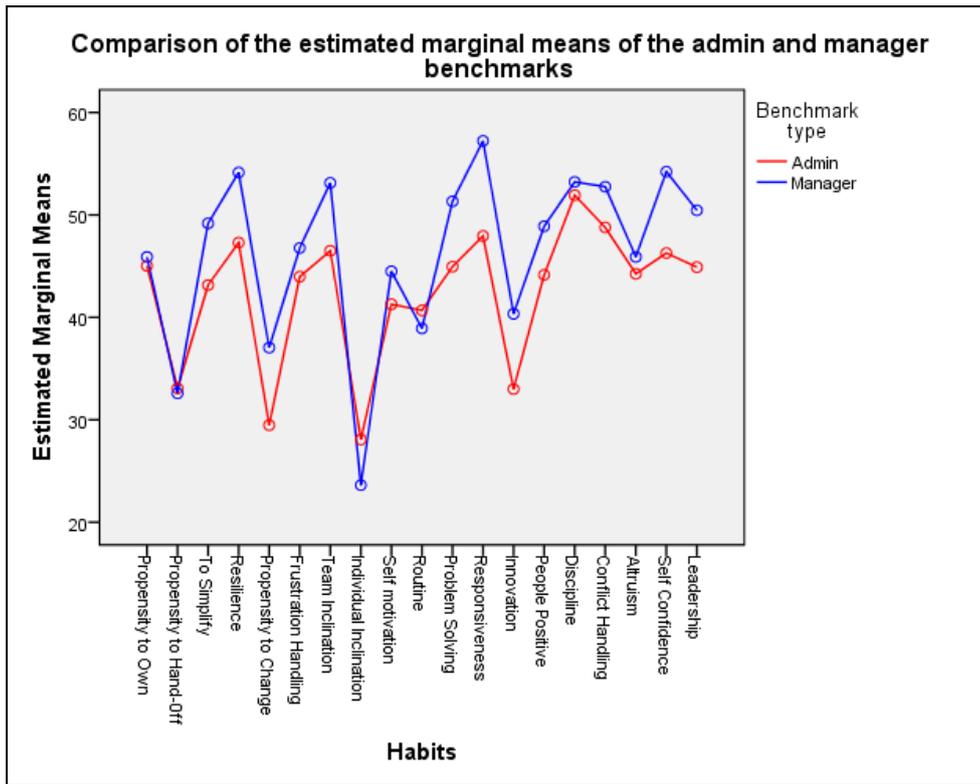


Figure 4.61: Profile plot of the comparison of the estimated marginal means of the admin and manager benchmarks

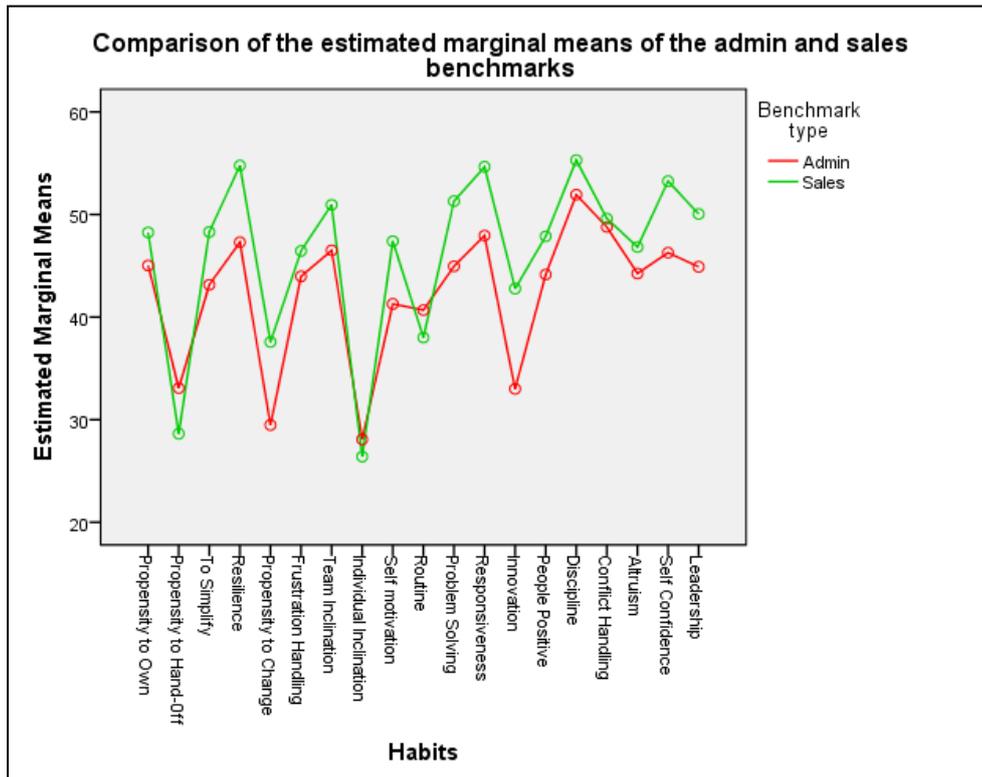


Figure 4.62: Profile plot of the comparison of the estimated marginal means of the admin and sales benchmarks

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

The profile plots in figures 4.59, 4.60, 4.61 and 4.62 visually display the variability of each comparison determined by the Scheffé test. The variability is seen in the differences between the two lines in each comparison; illustrated are various differences such as the difference in slope between two scores. The profiles of these four comparisons are the profiles that differed significantly. The other comparisons between the benchmark groups were non-significant.

### **4.5 Chapter summary**

The results of the data analysis of the current study were reported in this chapter. The sample consisted of a total of 320 individual scores. The habit of responsiveness had the highest mean of 55.78, whilst the habit of propensity to hand-off had the lowest mean of 30.05. There was no violation of the assumptions required for profile analysis. Profile analysis was then used to compare the profiles of the eight groups of benchmark types with regards to the marginal means of the 19 habits measured by Shadowmatch. The results of the profile analysis were significant for the test of parallelism, the test of difference among levels and also for the test of flatness. The groups were thus not parallel. There was a difference among the levels of the marginal means and the eight profiles were not flat. After this, a post hoc Scheffé comparison was conducted which indicated between which groups the variability determined by profile analysis existed. Chapter 5 discusses and interprets the results of the study, recommends further research possibilities and concludes the current study.

## **CHAPTER 5: DISCUSSION, RECOMMENDATIONS AND CONCLUSION**

In this chapter the results presented in Chapter 4 are discussed and interpreted. The overall results of the study are discussed in relation to the research question and objectives of the study. The overall intensities of each habit for the entire sample are first discussed and analysed. Thereafter, the suggested implications of the comparison of the eight different benchmark types are discussed. After this, the limitations of the current study and future recommendations for research follow, and lastly, the discussion ends with a general conclusion of the current study.

### **5.1 Discussion of results**

#### **5.1.1 Overall intensity of the 19 individual habits**

This section of the chapter aims to interpret the main results of the descriptive statistical analysis of the study that contribute to the understanding of the research question set out by the study. The first aspect of the results to be addressed is the mean of each dependent variable; the 19 habits measured by the Shadowmatch worksheet. As discussed in Chapter 3, the Shadowmatch worksheet indicates each behavioural pattern or habit as a score out of 100. The scores are depicted on a range from planned behaviour to radical habits – in other words, low intensity forced decisions to habitual naturally applied behaviour (De Villiers, 2009). Figure 3.1 in Chapter 3 shows these categories. The means of each habit is analyzed according to this range of habit categories. This was done to interpret the descriptive results and relate it back to the defining categories of the measurement instrument used in the study. The first part of this section discusses the descriptive statistics, and then the further results of the statistical analysis are taken into consideration in the sections that follow.

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The distribution of the overall habit means among these categories gives an interesting insight into the overall dynamics of the habits of top achieving individuals. None of the habit means of the current study fell within the category of planned behaviour. Planned behaviour, according to De Villiers (2009), needs effort and planning. The individual needs to consciously plan to behave in this way. These behaviours do not form a pattern within the individuals overall behavioural dynamics. On average the sample of 320 top achievers considered in the current study exhibited all 19 habits to a greater intensity than planned behaviour. It is interesting to note that top achievers generally did not have an intense absence of the habits measured by the worksheet; the 19 habits were all present to a larger extent.

Only one habit had a mean in the necessary behaviour category; this was the habit of individual inclination (mean = 28.66). Individual inclination with the lowest mean amongst all 19 habits was thus the habit that was expressed at the lowest intensity, if only the means are taken into consideration. Behaviours in this category will be a pattern if the situation constitutes the need for the specific behaviour. The behaviour is functional only in the situation of need, therefore the individual behaves in this way only if necessary (De Villiers, 2009). If only the means are considered, the habit of individual inclination was generally not a crucial habit for the top achievers. It is interesting to note that the preference for top achievers to work on their own, instead of in a team, is generally not a greatly expressed behavioural pattern in the current study. This finding suggests that an individualistic approach to one's environment is not the answer to achievement. This aligns more with a collectivistic approach rather than an individualistic approach which does not concur with the findings of Triandis and Gelfand (2012). The current study's results also do not concur with earlier research that found that theories of achievement are rooted more in individualism than collectivism (Spence, 1985). Nor do the results align with Nelson and Shavitt's (2002) notion

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that individualistic cultures place more importance on achievement. Before the current study was conducted, the researcher expected that the habit of individual inclination would be a more intensely expressed habit, considering the previous findings discussed in this section, but it is interesting to note that the results suggest otherwise. The difference in findings yields the possibility of further exploration of the interaction between the individualism-collectivism cultural construct and achievement, as well as the interaction of achievement with the vertical and horizontal dimensions of individualism.

Out of all the habits assessed in the current study, the habit of individual inclination was generally expressed at the lowest intensity. Therefore, the habit of being more inclined to function individually, as opposed to functioning within a team, is generally not the habit to focus on if an individual would like to develop behaviours generally shared by the various top achievers within the current study. This finding agrees with some of the notions in the work of Covey (1989). His work highlights seven repeated behaviours that improve the effectiveness of an individual; specific behaviours such as being proactive and synergizing. What is of interest here is that the seven habits Covey identified aim to help an individual to move from dependence to independence and ultimately interdependence. The finding that individual inclination is generally the lowest expressed habit amongst top achievers in the current study connects with this goal towards interdependence rather than sole dependence.

The next category of habits, contextual habits, was generally the most prominent category of habit mean scores in the current study. It was found that the mean of 14 of the 19 habits explored in the current study fell within this category. Contextual habits are habits you naturally use within your day-to-day situations and context. There is no need to plan this behaviour, it has formed a pattern. The individual can choose easily to behave this way (De Villiers, 2009). The habits of which the mean fell into this category, in order of lowest

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intensity of expression to highest intensity of expression, were: propensity to hand-off, propensity to change, routine, innovation, self motivation, altruism, frustration handling, people positive behaviour, team inclination, propensity to own, leadership, conflict handling and to simplify.

Four habits' means fell within the category of strong habits. These habits were resilience (mean = 51.66), self confidence (mean = 51.98), discipline (mean = 52.58) and responsiveness (mean = 55.78). De Villiers (2009) describes a strong habit as strong predictable behavioural patterns. In the majority of situations this behaviour will be shown without conscious planning. The behaviour is easily displayed even outside day-to-day activities. The individual strongly prefers to behave in this way. If the only factor taken into consideration was the mean of the habits, then these four habits were the defining habits for this group of top achievers. These habits overall had the strongest pattern of expression for the top achievers. The four habits based on just their mean can therefore generally be considered as the four most crucial habits of top achievers in the current study.

The definitions of the habits measured by the Shadowmatch worksheet were communicated in appendix A. However, the specific explanations of the general top four habits identified based on their mean in the study are communicated here in order to outline the results of the study. The habit of resilience is described by De Villiers (2009) as the habit of applying oneself relentlessly to solve problems and overcome challenges rather than give up easily when faced with a challenge. It is the habit of overcoming challenges despite the difficulties experienced and the tendency to complete a task irrespective of the difficulties and toughness of the journey. De Villiers' explanation of the habit of self confidence is the habit of acting with a high level of trust in your own abilities, qualities and judgement, knowing who you are and what you can and cannot do, behaviour that indicates someone's

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ability to act with conviction and stay with a decision that he/she has made. The habit of discipline is viewed by De Villiers as the habit of working under extreme levels of discipline, in a highly disciplined working environment where adherence to structure, rules and regulations and time-frames is essential. Responsiveness with the highest mean amongst all 19 habits was the habit that was generally expressed at the highest intensity. De Villiers (2009) describes the habit of responsiveness as the habit of acting immediately if and when necessary. This habit is an indication of the individual's reaction speed.

To conclude the exploration of the distribution of the overall habit means among the Shadowmatch habit categories, the final habit category is considered, namely the category of radical behaviour. De Villiers (2009) describes these radical habits as very strong. These patterns of behaviour will be followed in the majority of situations, even if they are very far removed from everyday lifestyle and activities. This behaviour could even be forced onto situations by the individual. For the group of top achievers in the current study no habits' mean fell within the category of radical behaviour. On average no habit was expressed to this extent.

It is interesting to note that for not one of the habits the mean fell within the edge categories; not the very bottom category of planned behaviour, nor the very top category of radical habits. It seems that the habits of top achievers are more adaptable and contextual, not set to the extreme, nor absent to the extreme. An overly extreme approach in any direction was not found for the intensity of the habits of the top achievers considered within the current study. Fourteen of the 19 habits fall within the contextual habit category, making the average overall dynamics of the habits of top achievers in the current study quite adaptable. The four habits that stand out, based on their means are the overall crucial habits of top achievers within the current study, if only the aspect of mean of the habits is taken into consideration.

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The first aspect of the discussion was the insights gained into the overall intensity of each individual habit of the 19 dependent variables of the current study. The next step is to assess how the eight benchmark types compared with regards to their habit profiles.

### **5.1.2 Comparison of the eight benchmark types**

The next aspect of the results to be addressed is the comparison of the profiles of the eight different benchmark types. This aspect aims to help further clarify the question the study set out to ask; the question of how the behavioural patterns (habits) of top achievers from diverse work environments compare. The comparison process involved profile analysis that compared the profiles of the eight groups of benchmark types with regards to the marginal means of the 19 habits measured by Shadowmatch. The main results of profile analysis were determined by three tests assessing the parallelism, difference among levels and flatness of the various profiles. The main results were displayed visually in the profile plot, figure 4.58 in Chapter 4, comparing the marginal means of the various benchmark types for each habit. The profile plot displayed the distribution of the variability among the intensity at which each benchmark type expressed the various habits. Thereafter a Sheffé post hoc comparison was conducted to further pinpoint the variability found by the profile analysis in terms of the differences based on the overall profile of each benchmark type. This section of the chapter aims to interpret the main results of the profile analysis and post hoc comparisons of the study that contributed to the understanding of the research question set out by the study. The main results of the profile analysis of the current study are listed and interpreted in the next sections.

The significant result for the profile analysis test of parallelism indicates that the eight different benchmark profiles of marginal means of the habits were not parallel between scores. This deviation was visually displayed in figure 4.58 where the segment of one

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benchmark type's profile plot line crosses the segment of another benchmark type's profile plot line between the same two scores. The significant result for the profile analysis test of difference among levels indicated that the groups are not at equal levels across scores. This was visually displayed in figure 4.58 where the profile plot lines of the various benchmark types were at different levels for the same score. The significant result for the profile analysis test of flatness suggests that the profiles do not exhibit flatness across scores. This was visually displayed in figure 4.58 where the profile plot lines of each benchmark type were not flat between scores.

The analysis asked whether different groups of top achievers had the same pattern of means for the range of habits. The answer was negative; the eight different groups of top achievers did not have the same pattern of means for the range of habits. The implication of this finding that different types of top achievers do not share the same pattern of habits suggests that different types of top achievers behave differently to a different extent. Variability among the profiles of the different types of benchmarks was determined by the profile analysis, therefore the variability need to be pinpointed. To assess the variability in terms of the different distribution of means for each benchmark for each habit, the profile plots were interpreted.

As mentioned in Chapter 4, it was found that for the habits of propensity to own, propensity to hand-off, frustration handling, discipline and leadership, the distributions of the different intensities at which the benchmark types express the habit were quite close together. In contrast to the latter, the habits of which the means were spread out over a fairly wide range for the different benchmark types were: to simplify, propensity to change, team inclination, responsiveness and innovation. The distribution of the means for the other habits fell somewhere between these two options and could therefore not be specifically assigned to

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either of the options. In this chapter the researcher is concerned with what is suggested by this distribution of benchmark type means for each habit.

On the one hand, a closely clustered group of means for a habit suggests that the different benchmark types scored very similar scores for this specific habit. On the other hand, a more spread out group of mean scores for a habit suggests greater variability amongst the different types of top achievers for this habit. A habit with a tight close distribution of the eight mean scores suggests that generally all types of top achievers compared in the current study express this habit at this same intensity. A habit with a loose wide distribution of the eight mean scores suggests that generally the different types of top achievers compared in the current study express this habit at different intensities. Thus, the habits that are shared by the different types of top achievers at the same intensities are propensity to own, propensity to hand-off, frustration handling, discipline and leadership. The other habits are not expressed at the same specific intensity by the different types of top achievers; there is variability in the expression intensity of the other habits.

The implications of the analyses of the means for each habit described in the previous section should be reevaluated to take into consideration the dynamics of the distribution of the eight different mean scores for each habit. This is done in the next section of this chapter.

A Scheffé test comparison was conducted to pinpoint the variability indicated by the profile analysis in terms of differences between complete profiles of different benchmark types. The results of the post hoc Scheffé comparison indicated that significant differences exist between the following profiles of benchmark types: administrative role vs. engineer, finance role vs. administrative role, manager vs. administrative role and sales vs. administrative role. The other relationships between the benchmark groups were non-significant. The implication of these results is that variability that was determined by profile

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analysis laid between these four comparisons of benchmark types with significant results with regards to the Scheffé test. The profiles of these four comparisons are the profiles that differed significantly. The three benchmark types that did not differ significantly from other profiles were customer support, exco and IT. It is interesting to note that the benchmark type of administrative role is part of each significantly different comparison. Further analysis is required to determine if the suggestion is valid, but it could be suggested that top achieving individuals in an administrative role have significantly different habits than the habits of the other top achievers considered in the current study.

According to Tabachnick and Fidell (2013), the Scheffé test is the most flexible of the popular methods of post hoc comparisons. There are no limits for the number of comparisons that can be performed with the Scheffé adjustment. This was ideal for the current study with eight groups of benchmark types to be compared. However, the Scheffé test is also the most conservative of the popular methods of post hoc comparisons, which means that a larger difference between means is required for significance. This conservativeness of the post hoc comparison, therefore, had the risk of identifying fewer significantly different comparisons between the profiles than expected. The post hoc comparison aspect of the results interpretation contributed to the understanding of answering the question the study set out to ask; the question of how the behavioural patterns (habits) of top achievers from diverse work environments compare.

### **5.1.3 The combined interpretation of the different aspects of the results interpretation to answer the research question**

The study set out to ask the question of how do the behavioural patterns (habits) of top achievers from diverse work environments compare. The objectives that were set out to answer this question were to:

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- Explore the extent to which top achievers' behavioural patterns or habits, as identified by the Shadowmatch worksheet, occur across different work environments.
- Identify the behavioural patterns or habits which are expressed the most intensely by top achievers across different work environments.
- Identify the behavioural patterns or habits which are expressed the least intensely by top achievers across different work environments.

To finally answer the research question set out by the current study, the various aspects of the results interpretation are combined in this section of the chapter. This is done in order to tie together the various indications of the results interpretation and indicate the overall answer to the research question of the study.

The interpretation of the means of each habit considered on its own indicated that the general crucial habits for top achievers are resilience, self confidence, discipline and responsiveness. However, the interpretations of the distribution of the intensities with which the different benchmark types express each habit indicate that the habits that are shared by the different types of top achievers at the same intensities are: propensity to own, propensity to hand-off, frustration handling, discipline and leadership. On the other hand, the habits of which the means were spread out over a fairly wide range and are thus not expressed by the different types of top achievers at the same intensities are: to simplify, propensity to change, team inclination, responsiveness and innovation. Therefore, even though responsiveness was the habit with the highest mean, it is not necessarily shared by the different types of top achievers at the same level of intensity. It is suggested that the other habits that are expressed at a similar intensity by different benchmark types are thus generally expressed at the determined intensity level by the different types of top achievers compared in the current study.

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It is therefore suggested that the habits of propensity to own, propensity to hand-off, frustration handling and leadership is a contextual habit for all types of top achievers compared in the study. It is not just the means of these habits that fall within the category of contextual habits; it can be expected that these habits will generally be expressed by the various types of top achievers compared in the current study at this level of intensity.

The only habit that is expressed by different types of top achievers at the same level of intensity and falls within the category of strong habits is the habit of discipline. It is therefore suggested that discipline is the only crucial habit shared by different types of top achievers at the same level of intensity. It is not just the mean of discipline that falls within the category of strong habits; it can be expected that discipline will generally be expressed by different types of top achievers at this level of intensity. The habit of discipline is thus highlighted by the results of the current study as the habit overall expressed by various types of top achievers at the highest level of intensity; a crucial habit for different types of top achievers. Discipline is “the habit of working under extreme levels of discipline, in a highly disciplined working environment where adherence to structure, rules and regulations and time-frames are imperative” (De Villiers, 2009, p.27). This finding creates the opportunity to further explore the interaction between the habit of discipline and achievement in various contexts. The discussion of this finding in relation to previous literature is limited by the extent of research on the habit of discipline of achievers.

As discussed in Chapter 2, several studies specifically focused on study and work related habits (Cappella et al., 1982; Chiu, 1997; Gadzella & Williamson, 1984; Keith et al., 1986; Nixon & Frost, 1990; Pintrich et al., 1993; Schutz, 1997). The current research study set out to explore the habits of achievers by first establishing if an individual is an achiever and to then explore which habits the achievers display and to which intensity. The results of

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the current study contributed to a broader exploration of habits and not just habits that were specifically related to academic work and studying, as in the studies mentioned here. The results of the study addresses more diverse habits expressed in a broader domain of life; rather the habit of discipline and not the specific act of finishing homework. More research on the behavioural patterns of achievers is needed to further explore this interaction. Many studies focus on very specific types of habits like study habits, but very few studies have focussed on the exploration of the broader behavioural patterns of achievers.

The work of Covey (1989) highlighted seven repeated behaviours that improve the effectiveness of an individual; specific behaviours such as being proactive and synergizing. If the current study were to follow suite with Covey's work, then discipline would be identified as the crucial habit of highly effective people, or in this case various top achievers. Duhigg's (2012) work emphasises the pivotal part habits can play in the process of achievement by stressing how the right habits are critical for success in doing a specific task in a specific environment. The current study helps to gain insight into which habits are the habits that play a critical part in achievement. For the top achievers considered in the current study the habit of discipline is a critical habit for achievement.

As discussed in Chapter 2, the field of positive organisational behaviour (POB) emphasizes the need for more focused research and theory building, together with effective application of positive behaviour of employees in organisations (Bakker & Schaufeli, 2008). The results of the current study may assist in creating more focused research and theory building for application of positive behaviour within organisations. The results could help to expand the limited literature on the topic of the habits of achievers, specifically within the field of positive organisational behaviour.

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Positive psychology conducts research to improve human life and functioning. The current study had this aim in mind. The results of the study align with Seligman's (1991) theory of "The Good Life". The results helped to gain insight into the way in which behavioural patterns are expressed by achievers, thereby expanding the understanding of the theory of the Good Life to help individuals to ultimately enhance their lives. The Shadowmatch system seeks to employ an individual within an environment where his/her natural behaviour patterns or habits allow the individual to flourish and become a top achiever. When the Shadowmatch system is implemented within a specific work environment, the benchmarks and other functionalities of the system assists in placing an individual in this desired environment. The depth of the discussion of the study's results in relation to previous research is limited by the extent of prior research on the topic of the habits of achievers. The question of the habits of achievers has not been addressed extensively within the field of psychology.

The aspects of the discussion highlighted the insights gained into the question the study set out to ask; the question of how the behavioural patterns (habits) of top achievers from diverse work environments compare. Insight was gained into which attributes and actions in life lead to individuals achieving in their particular environments; insight into the behavioural patterns or habits of top achievers. The results of the study helped to catalyze change in the field of psychology away from a constant pre-occupation with preventing and fixing the worst aspects of life and towards focusing on developing the best qualities in individuals (Seligman, 2002). The results helped to gain an understanding of which behaviours are significant for a diverse range of top achievers. The literature review of the current study started with the work of James (1890) and his understanding of the construct of habits. Now, more than a hundred years later, the exploration of habits, and specifically the habits of achievers, can continue by building on the insights gained in the current study and

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thereby continue to contribute to the body of knowledge within the paradigm of positive psychology.

The results of the study contributed to the knowledge base of the field of psychology, specifically within the South African context. The sampling population consisted of South African individuals and the measurement was developed and validated within the South African context. The vision of the Psychological Society of South Africa is to advance South African Psychology as a science and to promote the relevance and responsiveness of South African Psychology to the well-being of South African social societies (PsySSA, 2015). The current study aligned with this vision by trying to enhance the well being of South Africans by adding to the knowledge of the behaviour of individuals who achieve within their environments. The results can help direct the focus of future findings within South African psychology. The Shadowmatch measurement instrument helped to address the need for an adequate measure of habits as expressed by Verplanken (2006), and the results of the current study helped to build a foundation for further research on adequate measuring of habits.

The non-experimental descriptive research design of the current study did not set out to describe a relationship between the variables. The results were only applicable to the sample of the current study; the results do not imply a general relationship between the constructs explored in the research study in the overall population. Even though the results of the current study were only relevant specifically to the sample of top achievers in the study, further research can be spraked from the current study to attain results that are generalisable to a broader extent.

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### 5.2 Limitations

This section of the chapter aims to critically reflect on the limitations of the overall study. The limitations of a study are the characteristics of the methodology and design that influence the interpretation of the study's results (Gravetter & Forzano, 2012). A researcher's awareness of the limitations within a study is needed to address the possible impact the limitations might have had on the results of the study. The various limitations of the different parts of the research process of the current study are considered in this section.

#### 5.2.1 The extent of the data on the Shadowmatch database

The researcher made use of existing data on the Shadowmatch database; therefore, the extent of the database was the extent of possible data for the study. The researcher was limited by this in two ways; the first limiting aspect of the database was the variety of the different types of top achievers on the system and the second limiting aspect was the number of valid benchmarks within each group of benchmark types.

Ideally the range of different benchmarks to compare in a study on different types of top achievers could be broader. Unfortunately the study did not take place in an ideal world; the extent of the real data on the database that was used in the study was not endless. The different types of top achievers or benchmarks that could be compared were subject to whether the benchmark had been created on the system or not. Even though different types of top achievers were compared, the different types of top achievers were all in business work environments and not completely diverse. This occurred because the study required 12 valid benchmarks for each type of benchmark in order to adhere to the requirements of the statistical analysis technique of profile analysis used in the study. Only once a benchmark could be verified as valid could it be considered for the current study. There were many different types of top achievers on the system, but not all of these had enough valid

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benchmarks to be included in the current study. The researcher was therefore limited to only the benchmark types that had 12 or more valid benchmarks on the database. Although habits are part of any individual in any type of environment, the types of benchmarks that had so many valid benchmarks fell more in the business work environment than other environments. The reason for this is that Shadowmatch was administered within the business environment to a larger extent than non-business type environments. To compare completely diverse top achievers and broaden the scope of the different “types” of top achievers was not possible in the current study. The researcher was therefore limited during the sampling process to types of top achievers that had 12 valid benchmarks within the database of the Shadowmatch system. This limitation did, however, not limit the study to such an extent that the research question set out by the study could not be explored. There were a sufficient number of valid benchmarks to compare different types of top achievers, each with 12 valid benchmarks. The potential future research stemming from this limitation is discussed in the next section of this chapter.

### **5.2.2 The nature of the data on the Shadowmatch database**

The researcher made use of existing data on the Shadowmatch database; therefore, the nature of the data on the database determined the nature of the data that could be used in the study. The researcher was limited by two elements of the nature of the data on the Shadowmatch database.

The first limiting element of the nature of the data was the specific variables that were captured on the database. Variables such as gender, race and age fell outside the scope of the current study’s research question because the variables were not captured with the individuals’ results on the database. The researcher was limited by the variables that were captured on the system; the only variables that could be assessed were the variables that were

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captured when the original data was captured. This limitation did, however, not limit the study to such an extent that the research question set out by the study could not be explored. The nature of this limitation allows potential future research avenues to stem from it; this is discussed in the next section of this chapter.

The second limiting element of the nature of the data on the database was the fact that the researcher could not assure the effectiveness of the way in which the data was captured on the system originally. The specific element of the data capturing process to consider was the effectiveness of the in-house performance scoring systems used within the companies before Shadowmatch was administered. The researcher did not have control over the effectiveness and correctness of the performance evaluations done to identify top achieving individuals within a company. If the performance evaluation process used within a company was flawed and did not correctly identify the top achievers within the specific roles, then individuals could have possibly been included incorrectly in the benchmarks considered in the current study. There are standard Shadowmatch criteria for individuals to be considered a top achiever that were implemented in the system training of the users in each company, as described in Chapter 3. The Shadowmatch criteria of top achievers created a standardised way of identifying top achievers, but the effectiveness of the in-house performance evaluation process used before the Shadowmatch set of criteria was administered within a company could not be assured by the researcher.

### **5.2.3 The impact limitation of the results of the study**

The impact of the results of the current study is limited by the definitions of the constructs assessed in the current study, as defined by the Shadowmatch worksheet. The measurement instrument has been validated as described in Chapter 3. A specific aspect of importance in this validation process was the construct validity of the worksheet. This refers

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to the extent to which a measure assesses the theoretical construct it is intended to measure (Gravetter & Foranzo, 2012). The construct validity was verified, therefore the Shadowmatch worksheet measures the constructs that the worksheet intended to measure. The constructs that were assessed in the current study were operationalised according to the definition of the construct as defined by the measurement instrument used; this, however, limits the results to this specific frame of constructs. The results of the current study are specific for habits as measured by the Shadowmatch worksheet; habits as defined and outlined within the Shadowmatch system. Before the results can be generalized for habits measured by other measurement instruments, it should first be determined if the definition of the habit construct used within the other instrument match the definition frameworks of the constructs of the Shadowmatch worksheet. However, this limitation did not limit the study to such an extent that the research question set out by the study could not be explored, since the study was done within the framework of the Shadowmatch understanding of habits. This limitation was addressed with future use of the results of the study in mind.

### **5.2.4 The limited prior research on the topic of the current study**

As discussed in Chapter 2, the construct of habits and the construct of achievement have been explored from various paradigms within psychology. The research specifically addressing the habits of achievers is, however, not that extensive. The researcher was able to review quite a comprehensive amount of literature for the understanding of the construct of habits and the construct of achievement separately, but the question of specifically the habits of achievers has not been addressed thoroughly within the literature in the field of psychology; extent of literature on this topic is quite limited. This limited the researcher's ability to relate the results of the current study to other findings on the topic, since there is not an extensive amount of studies to relate to. The limitation also complicated the choice of

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theoretical framework since there are not many theories with regards to the habits of achievers to choose from. This limitation is an indication of the potential of future research on the topic. This aligns with Bakker and Schaufeli (2008) expressing the need for more focused research and theory building. In the next section the recommendations for further research are discussed.

### **5.3 Recommendations for further research and applications**

In Chapter 1 of the current study the field of positive organisational behaviour within the paradigm of positive psychology expressed the need for more focused research and theory building together with effective application of positive behaviour of employees in organisations (Bakker & Schaufeli, 2008). The results of the current study aimed to help aid this need by contributing towards the body of research. Aspects of one study have the possibility to stimulate suggestions for further research, whether it is to build on the results of the first study or to address the topic in a new context. The insight gained into the habits of top achievers by the current study has created various future research possibilities.

#### **5.3.1 The comparison of a broader spectrum of achievers**

The first suggestion for further research stems from the limitation of the extent of the data on the database. Further research could expand the findings on the habits of top achievers by comparing top achievers from a broader, more diverse spectrum of top types of top achievers. For example, top teachers, top politicians, top athletes, top CEOs, top musicians and top engineers could be compared. By searching for specific top individuals in various fields to compare completely diverse top achievers, the research could have a more diverse comparison of top achievers. This will eliminate the limitation of a limited data base within which it was only possible to compare different types of top achievers within the

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business environment. A more diverse comparison could help to expand the understanding of the habits of top achievers.

### **5.3.2 Research exploring other aspects of achievers in relation to their habits**

The second suggestion for further research stems from the limitations of the nature of the data on the database of the current study. Other variables such as gender, race and age can be combined into a study to explore the habits of top achievers whilst addressing another aspect of the top achievers. The dependent variables of the current study were the 19 habits, but future research could include a combination of other dependent variables; to see for instance how the habits of male top achievers compare to the habits of female top achievers or the comparison of habits of top achievers from various generations. This suggested further research could seek to answer questions such as whether the habits of an individual changes over time. Instead of exploring achievement, as for example in a study such as Peterson's (2000) work, asking if there exists a consistency in the mode of achievement, habits can be explored. If the researcher is not limited by previously captured variables, the possibilities of variables to combine into the study of the habits of top achievers are immense.

### **5.3.3 Exploring more specific types of achievers**

The next suggestion for further research is to explore more specific groups of top achievers. Instead of broadening the scope of the study rather narrow it down, i.e. to move from general to more specific findings. For instance, a more specific comparison of top achievers in work environments could be done by using narrower sub strata, for example by comparing top engineers in small businesses to top engineers in medium businesses to top engineers in corporate businesses.

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Further research on the topic will help eliminate the limitation of limited prior research on the topic for future research studies. These suggestions of further research are merely a few specific examples. By assessing a topic within a new context, or building on previous findings on the topic, or expanding the theory by adding a new dimension to the research, the possibility to broaden the knowledge base of an understanding of a topic always exists. The question is which dimension the future researcher would like to explore and expand; the insights gained by the current study are merely a small glimpse into the dynamics of the habits of top achievers.

### **5.3.4 Applications of research findings in work environments**

The introduction to this section highlighted the need expressed by Bakker and Schaufeli (2008) for the application of the research and theories on positive behaviour of employees in organisations. The findings of the current study have a few practical implications for work environments. Organisations can practically use the insights gained by the current study to their benefit by applying it to their processes. For example the findings of the current study can be used to help identify potential future top performers, it can help guide businesses in their recruitment processes and understand the unique behaviour of an individual. It can guide the environment's development programmes, leadership identification, succession planning, redeployment of staff, and can assist in better day-to-day management of staff. Behavioural analysis of both the candidate and their working team or peers in the same role will reveal exactly how similar or complimentary their working habits are, what effect that will have on their expected performance, and how to immediately develop them post-hire to ensure success. Therefore to enhance the recruitment process of a work environment the applicant's behavioural patterns can be assessed by means of the Shadowmatch worksheet. The results of the various applicants can then be assessed and

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

compared to see whether the applicant's behavioural pattern aligns with the behavioural patterns of the top achievers within the environment and whether the applicant's behavioural patterns align with the findings of the current study. By having a better understanding of the behaviours of top achievers it opens up the possibility to develop individuals towards achievement.

### 5.4 Conclusion

At the very beginning of the current study the words of Gillham and Seligman (1999) were introduced: "We desperately need a positive psychology that provides us with information about how to build virtues like creativity, hope, future-mindedness, interpersonal skill, moral judgment, forgiveness, *humor [sic]* and courage and how to enhance happiness and life satisfaction" (p. S169). The current study provided information on which attributes and actions in life lead to individuals achieving in their particular environments, thereby contributing towards a positive psychology. By using the statistical analysis technique of profile analysis to compare the 19 habits measured by the Shadowmatch worksheet between eight different types of top achievers, insight was gained into the habits of top achievers. The habit of discipline was highlighted by the results of the current study as the habit overall expressed by various types of top achievers at the highest level of intensity; it is a crucial habit shared by different types of top achievers.

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## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Appendix A: Definitions of habits identified by the Shadowmatch worksheet.**

**Propensity to own versus Propensity to hand-off:** These two habits indicate whether the individual takes ownership to solve a problem and handles a challenge him/herself, or whether he/she prefers an outside agent to solve problems, handle difficulties or even execute tasks. It refers to the place where the individual places the control and/or task execution, with him/herself or outside of him/herself. In some jobs a habit of handing-off a task is necessary, in some jobs it's not. The same applies to keeping the task as a self execution responsibility. From the data gathered by Shadowmatch, it is clear that for some unique tasks a balance between the two is necessary.

**To Simplify:** This refers to the habit of breaking complex scenarios down to linear challenges that can easily be resolved. It can be seen as the habit of taking the easy route towards solving complex challenges. The purpose of this habit normally ties up with efficiency, whereby an individual has developed the ability to easily find the simple way to resolve challenges/problems. The habit of simplification can develop in tandem with the habit of problem solving. When both these habits are well formed the individual might develop extremely strong behaviours towards effectively solving problems by applying extremely simple ways towards a solution.

**Resilience:** Some people give up easily when faced with a challenge and some apply themselves relentlessly to solve problems and overcome challenges. The Shadowmatch worksheet calculates the habit of the person in overcoming challenges despite the difficulties experienced. It also calculates whether the individual tends to give up, or whether he/she completes a task despite difficulties and toughness of the journey. Be aware of the fact that if the individual answers the questions in a specific way, it might indicate a negative level of resilience. When this happens, the indication is that the specific person tends to disembark

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

from a task not because he/she experienced the task to be tough, but because he/she anticipates it to be tough without even trying. If this is a habit (giving up without even trying) the individual will also tend to develop a habit of low self-confidence.

**Propensity to Change:** Some people find it very difficult to adapt to change and to get comfortable with new methods, new ways of doing things, a new environment and new technology. On the other hand there are people who advocate change; they always venture towards new frontiers. These people are very comfortable with anything new, be it a new job, new ways of doing things, new technology and so on. Shadowmatch determines how positive (comfortable) the individual behaves towards change and adopts anything new, different and even strange. If this is marked as a habit (more than 50 points), it indicates the behavioural pattern of pushing for change, early embracing the new and even inviting those around them to participate in a process of changing the world where they work and live.

**Propensity to Handle Frustration:** This Shadowmatch calculator indicates an individual's habit towards applying positive behaviour when dealing with frustrating circumstances. Frustration occurs when the individual is obstructed from reaching his/her goal. It is the experience that stems from a situation when obstacles block one from reaching a goal. A high graph indicates a strong habit of handling a frustrating situation. The behaviour types that Shadowmatch measures are those acts whereby the individual deals with the obstructing source/interference in such a way that his/her actions towards successful results stay on track.

**Team/Individual Inclination:** The system calculates, according to the answers given, whether the individual prefers working as part of a team, or whether he/she prefers working as an individual. When these two calculations are very close to each other, it indicates that the individual is equally comfortable working in a team or as an individual.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Self Motivation:** Some people have the habit of energising themselves whilst others are dependent on external energisers to stay positive, driven and active. Shadowmatch calculates the individual's habit towards the capacity of the individual to behave with high levels of energy, despite the absence of external motivating agents. Self Motivation is the behaviour of continuous positive action towards a desired outcome in the absence of external energisers.

**Routine:** The routine graph is an indicator of an individual's habit towards structure and repetition, sometimes even mundane activities. It determines whether the individual has a habit of behaving in harmony with an environment of repetition and patterns of the same behaviour. A high graph indicates a high propensity towards a positive blend between the individual and an environment where structure and routine result in a reality whereby every day is pretty much the same as the previous.

**Problem Solving:** This is the habit of engaging with challenges on a conceptual, social and practical level and successfully managing these difficulties/challenges towards resolving them. People with a strongly embedded habit of problem solving easily become intrigued by challenges and riddles to be resolved. In fact, if anybody scores more than 70 points on problem solving, they will find it extremely difficult not to engage with a challenge to be resolved. When an individual scores less than 30 points he/she will find it easy to bypass or even ignore a problem that needs some effort to be resolved.

**Responsiveness:** This indicates the individual's reaction speed, in other words the habit of acting immediately if and when necessary. A low graph will merely indicate that an individual does not have the habit of acting immediately, whilst a high graph indicates the habit of acting immediately. As with all Shadowmatch indicators, there is no good or bad in this calculation. In some jobs people do not need to act quickly, they need to wait and think

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

very thoroughly. In some jobs people must act quickly. This indicates the individual's inclination. A high score indicates a strong habit of responsiveness.

**Innovation:** This is the habit of finding new ways and identifying better processes and methods to improve on current methods of working. It also indicates the habit of working out-of-the-box and creating new realities. Shadowmatch defines innovation as the behaviour of an individual doing things that are new, designing new practical functionalities that improve on the way things are done and even creating new realities. Someone with great ideas is not regarded as innovative. Shadowmatch regards them as dreamers – something Shadowmatch prefers not to map or pretend to understand.

**People Positive Behaviour:** This calculates whether the individual has the habit of working with people in a positive way and building positive relationships. It also tracks the way a person influences people towards a positive and meaningful experience of life. The system follows answers that will indicate a natural people oriented person, somebody not easily frustrated by others.

**Discipline:** This refers to the habit of working under extreme levels of discipline, in a highly disciplined working environment where adherence to structure, rules and regulations and time-frames are imperative. People with a high (above 70) score on this habit will even create structures of discipline for others to adhere to. Individuals with an extremely low score do not easily conform to structure, discipline and strict order.

**Conflict Handling:** Conflict manifests in a situation where people have opposing interests that might unfold with destructive consequences to each other. This reading on the Shadowmatch graph indicates the habit of dealing with conflict in a positive way towards an outcome with no or minimal negative consequences for either party. Avoiding conflict is not regarded by this worksheet as a positive way to deal with it.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Altruism:** This reflects a person's willingness to help others without expecting something back. People who have a strong altruistic habit are relatively free from the 'What's in it for me' approach to helping others. These people do well in service driven jobs. Shadowmatch has gathered evidence to the effect that a high score on altruistic behaviour does not always indicate a high score on people positive behaviour.

**Self Confidence:** Shadowmatch calculates behaviour that indicates the person's ability to act with conviction and stay with a decision that he/she has made. In short, self-confidence is the habit of acting with a high level of trust in your own abilities, qualities and judgment, knowing who you are and what you can and cannot do. A high score indicates that an individual has a habit of acting in a secure and confident manner.

**Leadership:** Shadowmatch defines leadership as the ability to integrate resilience, discipline, a team oriented approach, the propensity to act immediately and self confidence with an attitude of positive involvement. All these behavioural strengths are harnessed to lead a group of people towards a successful outcome.

(De Villiers, 2009)

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Appendix B: Permission to use Shadowmatch data for research**

DE VILLIERS, BESTER &amp; ASSOCIATES

custom consulting...your context

8 September 2014

Permission to use Shadowmatch data for research

To Whom It May Concern:

This letter serves to confirm that the partners of De Villiers, Bester and Associates (owners of Shadowmatch), Pieter de Villiers (5606095055082) and Lizette Vera Bester de Villiers (ID 7204010016088) herewith grant Suzanne Nolte permission to use Shadowmatch benchmarks for research purposes. Data will be extracted from the system and made available anonymously for the research purposes.

Yours sincerely

**Lizette Bester de Villiers****Partner:****De Villiers, Bester and Associates****082 895 3237**
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## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Appendix C: Contract clause - consent to use Shadowmatch data for research purposes****Shadowmatch®**

- 4.5 DBA reserves the right to withhold access to the Shadowmatch system should the client be in breach of any contractual conditions hereunder.
- 4.6 DBA reserves the right to process all data and data profiles captured by the Shadowmatch system for research and development purposes.**
- 4.7. Save for the provision of access and use to the client, DBA shall further provide the client with consulting services if and when necessary. A separate agreement shall be entered into in respect of the consulting services to be rendered.

**Appendix D: Researcher's certificate of completion of Shadowmatch training**A certificate of completion for Suzanne Nolte, awarded by Shadowmatch Training. The certificate is framed by a decorative blue border with a repeating pattern. The text is centered and reads: "Certificate of Completion", "Suzanne Nolte", "Has Completed the Course", "Shadowmatch Administrator Training v2", "With a Score of 98%", and the "Shadowmatch" logo. At the bottom, it lists "Shadowmatch Training", "Shadowmatch University", the date "2014-09-02", and the ID "982124798".

## Certificate of Completion

**Suzanne Nolte**

Has Completed the Course

Shadowmatch Administrator Training v2

With a Score of 98%

**Shadowmatch**<sup>®</sup>

Shadowmatch Training  
Shadowmatch University

2014-09-02

982124798

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Appendix E: Example question of Shadowmatch worksheet**

**Shadowmatch®**

**Question 2:**  
**When witnessing a car accident:**

- Do you always stop to offer your assistance?
- Phone 911 (police / emergency services)?
- Both of the above?
- Become so stressed that you just can't do anything?
- Drive past, feeling very sorry for the people but leaving the support for those who are properly trained?

**<< BACK**      **NEXT >>**      **PAUSE**

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

### Appendix F: Bivariate correlations of the relationship between the Shadowmatch habits and convergent and discriminant personality measures

Table 2: Bivariate Correlations

Shadowmatch Habit	Convergent	Discriminant
<b>Propensity to Own:</b> take ownership of things that need to be done; doing things by yourself	Self-Discipline (.34***)	Adventurous (.10)
<b>Propensity to Handoff:</b> allowing others to do work for you	Cooperation (-.24**)	Adventurous (.07)
<b>Simplify:</b> breaking complicated challenges down into simple, linear problems that can be resolved more easily	Neuroticism (-.20*)	Altruism (.02)
<b>Resilience:</b> relentlessly applying yourself to complete a difficult task	Vulnerability (-.36***)	Altruism (.15)
<b>Change:</b> being comfortable with change; a preference for change rather than being stagnant	Openness (.19*)	Conscientiousness (.10)
<b>Frustration:</b> how one deals with frustration (e.g., positive, negative, passive)	Vulnerability (-.39***)	Openness (.18)
<b>Team Inclination:</b> strong preference towards working as part of a team	Trust (.29**)	Intellect (.07)
<b>Individual Inclination:</b> strong preference to working in isolation or by yourself	Gregariousness (-.41***)	Intellect (.01)
<b>Self Motivation:</b> extent to which one is generally intrinsically motivated	Self-Discipline (.43***)	Openness (.08)
<b>Routine:</b> tendency to organize your world towards strict patterns of sameness	Conscientiousness (.19*)	Altruism (.18)
<b>Problem Solving:</b> habit (ability) of comfortably engaging in problems	Intellect (.23*)	Altruism (.12)
<b>Responsiveness:</b> preference towards acting immediately when being given a job to do	Assertiveness (.25**)	Openness (.14)
<b>Innovation:</b> initiative towards creating new technologies or methods	Adventurous (.23*)	Agreeableness (.08)
<b>People Positive:</b> types of relationships built with others (e.g., positive, negative)	Cooperation (.22*)	Cautiousness (.03)
<b>Discipline:</b> a pattern of behavior towards working and living under strongly regulated conditions of order, systematic procedures	Self-Discipline (.36***)	Adventurousness (.06)
<b>Conflict Handling:</b> preference of dealing with conflict (positive manner, negative manner)	Agreeableness (.21*)	Self-Discipline (.03)
<b>Altruism:</b> helping other people in need without expecting any form of compensation	Altruism (.20*)	Intellect (.11)
<b>Self Confidence:</b> behavior that shows that a person trusts his/her own abilities towards doing a job successfully	Self-Efficacy (.25**)	Adventurous (.07)
<b>Leadership:</b> behavior of guiding and energizing a group of people towards a goal	Assertiveness (.36***)	Openness (.08)
<b>Task Efficiency:</b> how quickly and accurately one completes tasks	Conscientiousness (-.20*)	Adventurous (-.05)

Note: The numbers in parentheses are the correlation coefficients, with higher numbers indicating a greater degree of relationship between the two variables. The asterisks indicate the level of statistical significance of the correlation such that a  $p$  value  $< .05^*$ ;  $< .01^{**}$ ;  $< .001^{***}$ . The lower the  $p$  value the greater the statistical significance. Traditionally, a  $p$  value less than .05 is considered statistically significant.

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

**Appendix G: Descriptive statistics of the sample for profile analysis****Table 4.26: Descriptive statistics of the sample for profile analysis**

<b>Descriptive Statistics</b>				
Benchmark type		Mean	Std. Deviation	N
Propensity to Own	Admin	45.03	6.355	40
	Customer Service	46.30	7.094	40
	Engineer	48.85	5.260	40
	Exco	48.60	6.088	40
	Finance	48.85	5.842	40
	IT	49.18	6.118	40
	Manager	45.90	6.230	40
	Sales	48.25	4.797	40
	Total	47.62	6.132	320
Propensity to Hand-off	Admin	33.08	5.516	40
	Customer Service	31.20	7.443	40
	Engineer	29.25	6.012	40
	Exco	28.88	5.902	40
	Finance	29.23	6.066	40
	IT	27.55	5.184	40
	Manager	32.58	5.746	40
	Sales	28.63	5.452	40
	Total	30.05	6.174	320
To Simplify	Admin	43.15	10.277	40
	Customer Service	44.73	9.656	40
	Engineer	54.83	6.902	40
	Exco	54.70	7.630	40
	Finance	48.98	7.234	40
	IT	53.00	9.573	40
	Manager	49.18	7.903	40
	Sales	48.30	8.269	40
	Total	49.61	9.352	320
Resilience	Admin	47.30	7.985	40
	Customer Service	48.10	9.636	40
	Engineer	53.83	9.221	40
	Exco	50.75	9.556	40
	Finance	54.13	7.677	40
	IT	50.28	7.649	40
	Manager	54.15	8.350	40
	Sales	54.78	9.601	40
	Total	51.66	9.084	320
Propensity to Change	Admin	29.48	7.713	40
	Customer Service	35.28	7.643	40
	Engineer	39.85	8.885	40
	Exco	37.90	9.660	40
	Finance	38.38	9.489	40
	IT	40.48	9.285	40
	Manager	37.05	9.120	40
	Sales	37.58	8.927	40
	Total	37.00	9.345	320

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

Descriptive Statistics				
Benchmark type		Mean	Std. Deviation	N
Frustration Handling	Admin	43.98	8.037	40
	Customer Service	44.03	8.769	40
	Engineer	46.85	8.833	40
	Exco	41.88	10.955	40
	Finance	48.78	6.989	40
	IT	43.60	7.428	40
	Manager	46.78	9.488	40
	Sales	46.45	9.698	40
	Total	45.29	9.013	320
Team Inclination	Admin	46.50	8.118	40
	Customer Service	44.85	8.868	40
	Engineer	46.70	8.721	40
	Exco	45.50	8.979	40
	Finance	48.95	9.666	40
	IT	43.03	7.856	40
	Manager	53.13	7.508	40
	Sales	50.95	11.055	40
	Total	47.45	9.351	320
Individual Inclination	Admin	28.08	6.650	40
	Customer Service	30.98	6.930	40
	Engineer	29.10	4.940	40
	Exco	31.58	7.038	40
	Finance	27.95	7.289	40
	IT	31.55	6.809	40
	Manager	23.63	4.986	40
	Sales	26.40	7.632	40
	Total	28.66	7.027	320
Self motivation	Admin	41.28	7.562	40
	Customer Service	42.70	8.665	40
	Engineer	43.63	8.104	40
	Exco	44.05	7.749	40
	Finance	44.73	6.741	40
	IT	42.43	7.278	40
	Manager	44.50	7.528	40
	Sales	47.40	7.445	40
	Total	43.84	7.763	320
Routine	Admin	40.68	8.911	40
	Customer Service	38.75	10.848	40
	Engineer	37.30	8.231	40
	Exco	36.40	8.503	40
	Finance	42.53	9.392	40
	IT	36.00	9.038	40
	Manager	38.93	10.108	40
	Sales	38.00	8.385	40
	Total	38.57	9.342	320

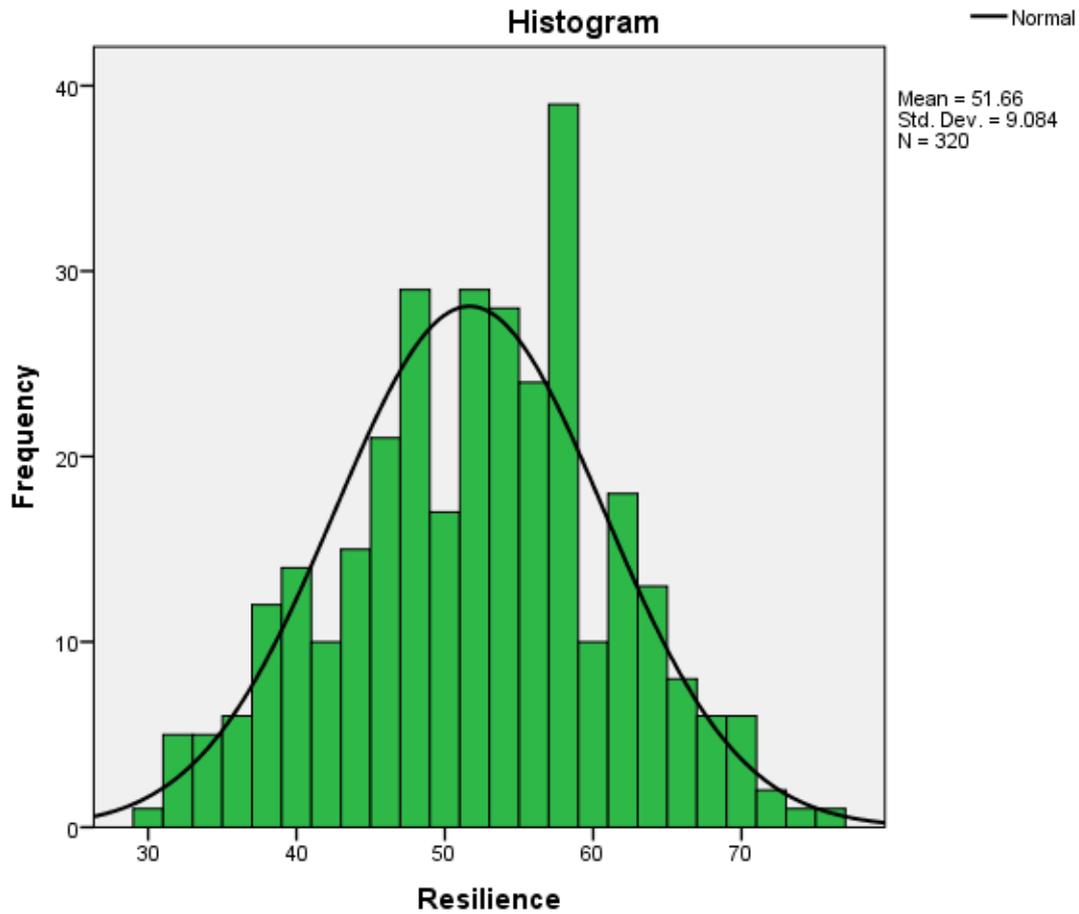
## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

<b>Descriptive Statistics</b>				
Benchmark type		Mean	Std. Deviation	N
Problem Solving	Admin	44.95	6.778	40
	Customer Service	45.73	7.832	40
	Engineer	52.25	6.440	40
	Exco	52.55	7.487	40
	Finance	50.73	5.782	40
	IT	50.25	5.759	40
	Manager	51.33	6.427	40
	Sales	51.30	4.837	40
	Total	49.88	6.966	320
Responsiveness	Admin	47.95	9.724	40
	Customer Service	50.90	10.017	40
	Engineer	59.05	8.019	40
	Exco	59.98	7.206	40
	Finance	57.25	7.662	40
	IT	59.28	7.114	40
	Manager	57.23	7.921	40
	Sales	54.65	7.396	40
	Total	55.78	9.067	320
Innovation	Admin	33.00	9.016	40
	Customer Service	38.55	8.930	40
	Engineer	45.83	8.735	40
	Exco	45.88	9.411	40
	Finance	41.53	6.748	40
	IT	46.85	8.451	40
	Manager	40.35	8.983	40
	Sales	42.78	7.604	40
	Total	41.84	9.477	320
People Positive	Admin	44.15	8.772	40
	Customer Service	44.88	8.930	40
	Engineer	46.00	10.682	40
	Exco	41.90	10.645	40
	Finance	46.93	9.291	40
	IT	41.85	8.994	40
	Manager	48.90	9.281	40
	Sales	47.88	11.170	40
	Total	45.31	9.959	320
Discipline	Admin	51.93	6.639	40
	Customer Service	51.43	8.679	40
	Engineer	52.35	6.546	40
	Exco	51.23	9.155	40
	Finance	54.28	6.854	40
	IT	50.93	6.281	40
	Manager	53.23	8.062	40
	Sales	55.30	8.115	40
	Total	52.58	7.667	320

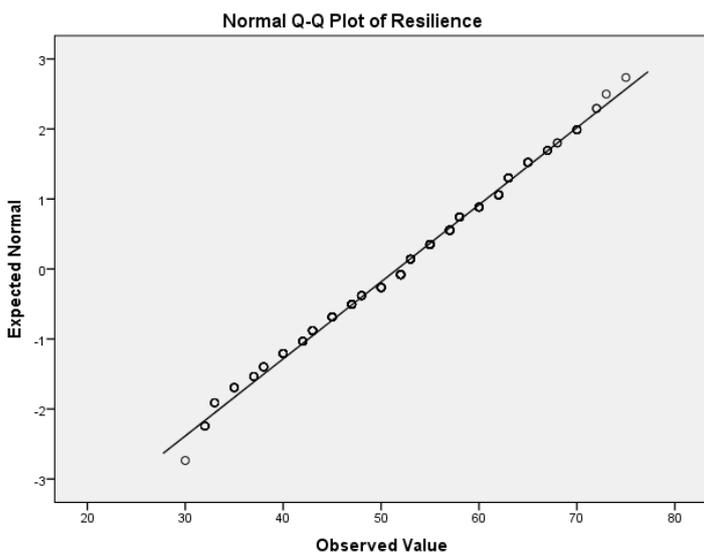
## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

Descriptive Statistics				
Benchmark type		Mean	Std. Deviation	N
Conflict Handling	Admin	48.78	10.045	40
	Customer Service	44.53	10.031	40
	Engineer	49.55	11.693	40
	Exco	46.38	11.595	40
	Finance	50.10	9.705	40
	IT	45.58	9.315	40
	Manager	52.75	9.580	40
	Sales	49.60	8.593	40
	Total	48.41	10.327	320
Altruism	Admin	44.25	10.114	40
	Customer Service	42.90	10.129	40
	Engineer	43.90	11.705	40
	Exco	38.90	12.027	40
	Finance	47.23	10.974	40
	IT	41.98	9.475	40
	Manager	45.90	10.017	40
	Sales	46.83	12.730	40
	Total	43.98	11.134	320
Self Confidence	Admin	46.28	7.848	40
	Customer Service	49.13	9.895	40
	Engineer	55.45	10.013	40
	Exco	52.68	8.810	40
	Finance	51.45	9.307	40
	IT	53.43	7.049	40
	Manager	54.23	7.127	40
	Sales	53.25	10.030	40
	Total	51.98	9.177	320
Leadership	Admin	44.90	4.781	40
	Customer Service	45.38	6.491	40
	Engineer	48.95	5.957	40
	Exco	48.10	6.025	40
	Finance	49.00	5.454	40
	IT	47.45	4.088	40
	Manager	50.45	4.506	40
	Sales	50.05	6.409	40
	Total	48.03	5.791	320

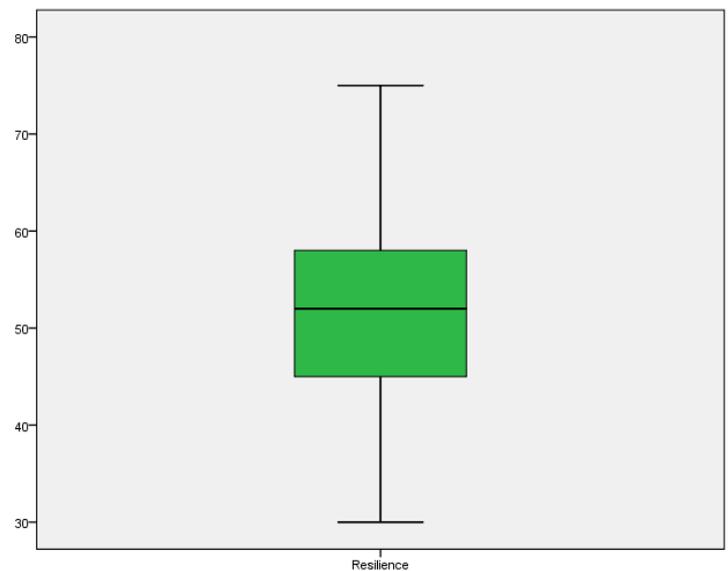
**Appendix H: The histogram, normal Q-Q plot and boxplots of a few of the habits**



**Figure 4.10 Histogram of the habit of resilience**



**Figure 4.11: Normal Q-Q plot of the habit of resilience**



**Figure 4.12: Boxplot of the habit of resilience**

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

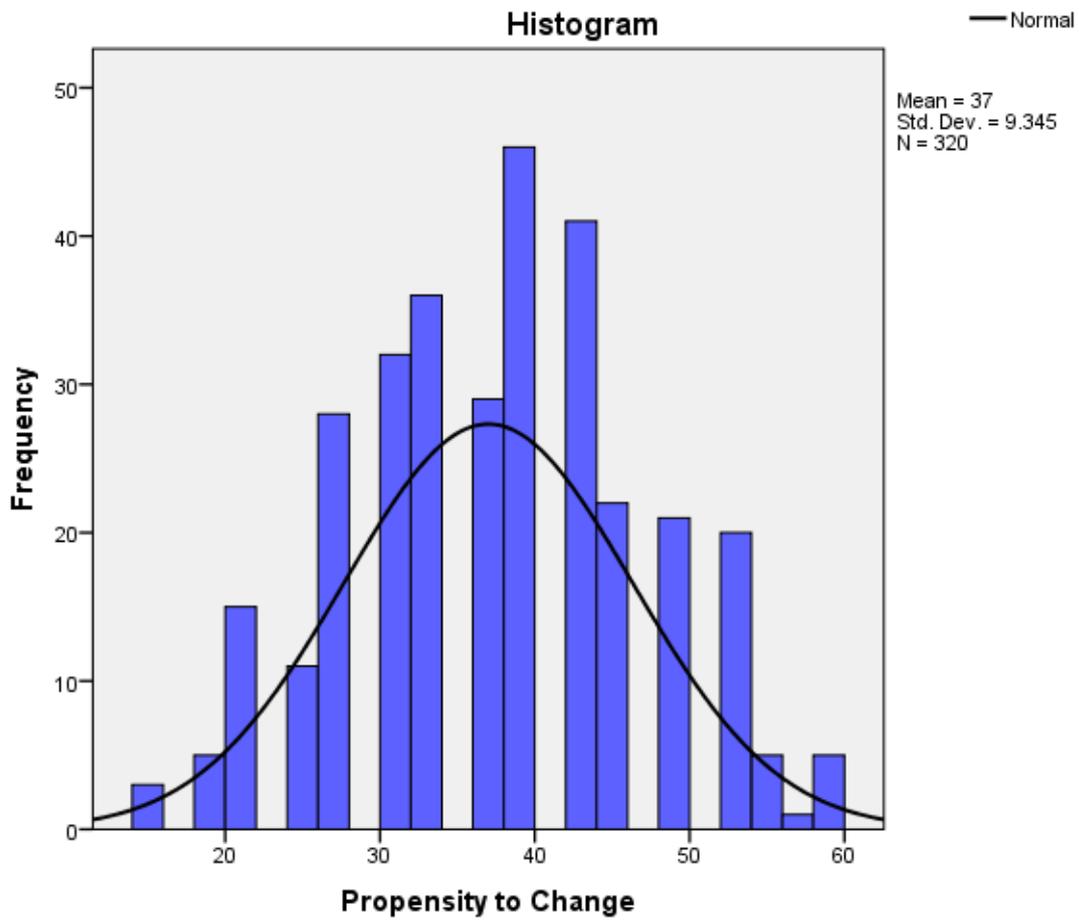


Figure 4.13: Histogram of the habit of propensity to change

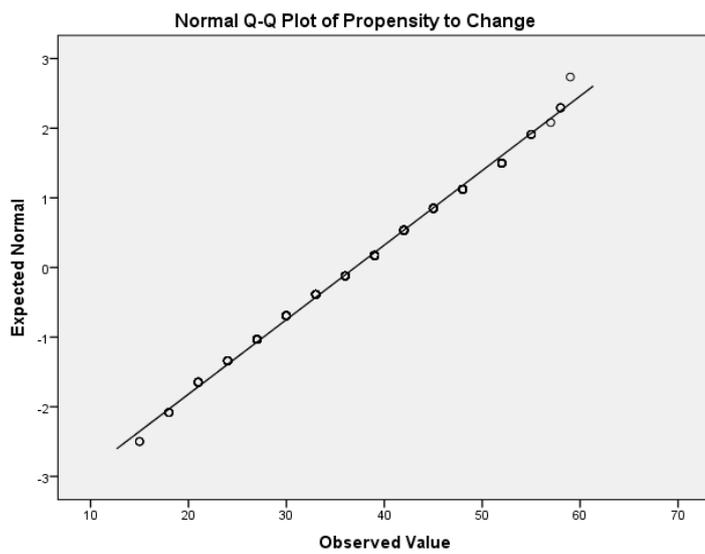


Figure 4.14: Normal Q-Q plot of the habit of propensity to change

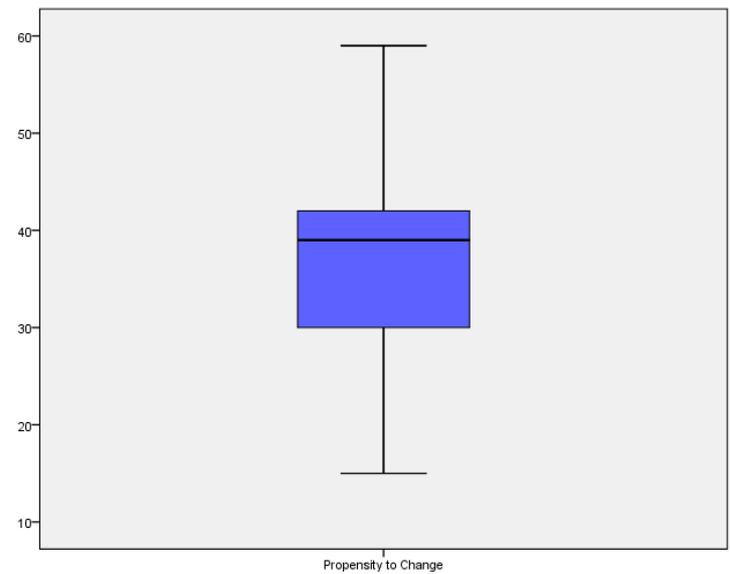


Figure 4.15: Boxplot of the habit of propensity to change

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

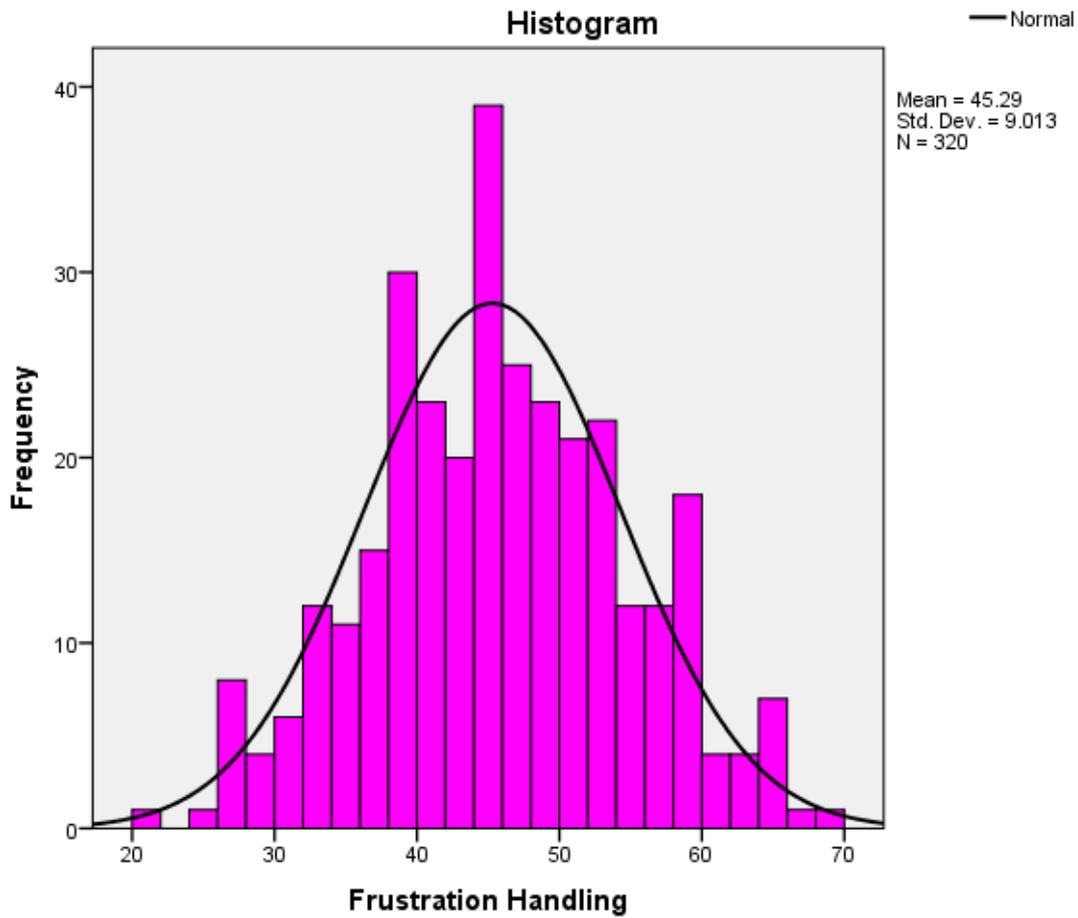


Figure 4.16: Histogram of the habit of frustration handling

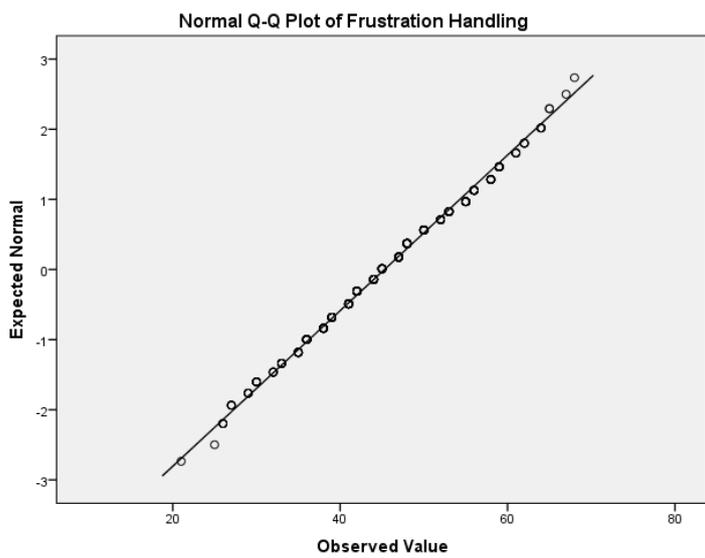


Figure 4.17: Normal Q-Q plot of the habit of frustration handling

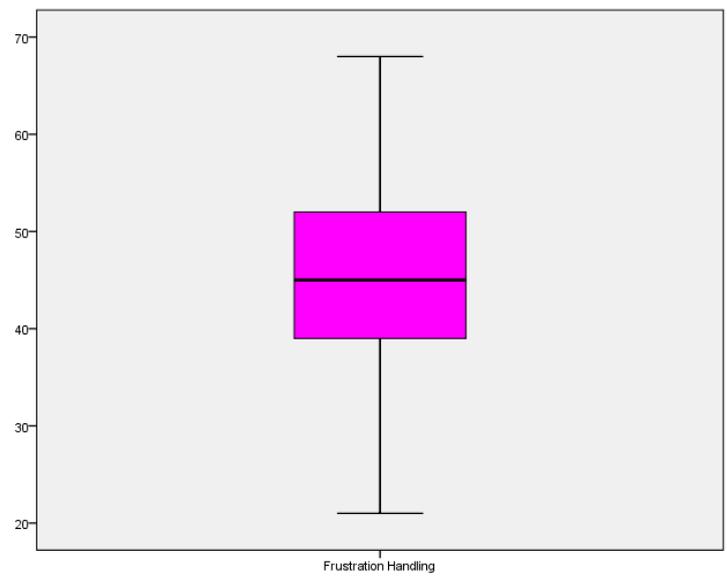


Figure 4.18: Boxplot of the habit of frustration handling

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

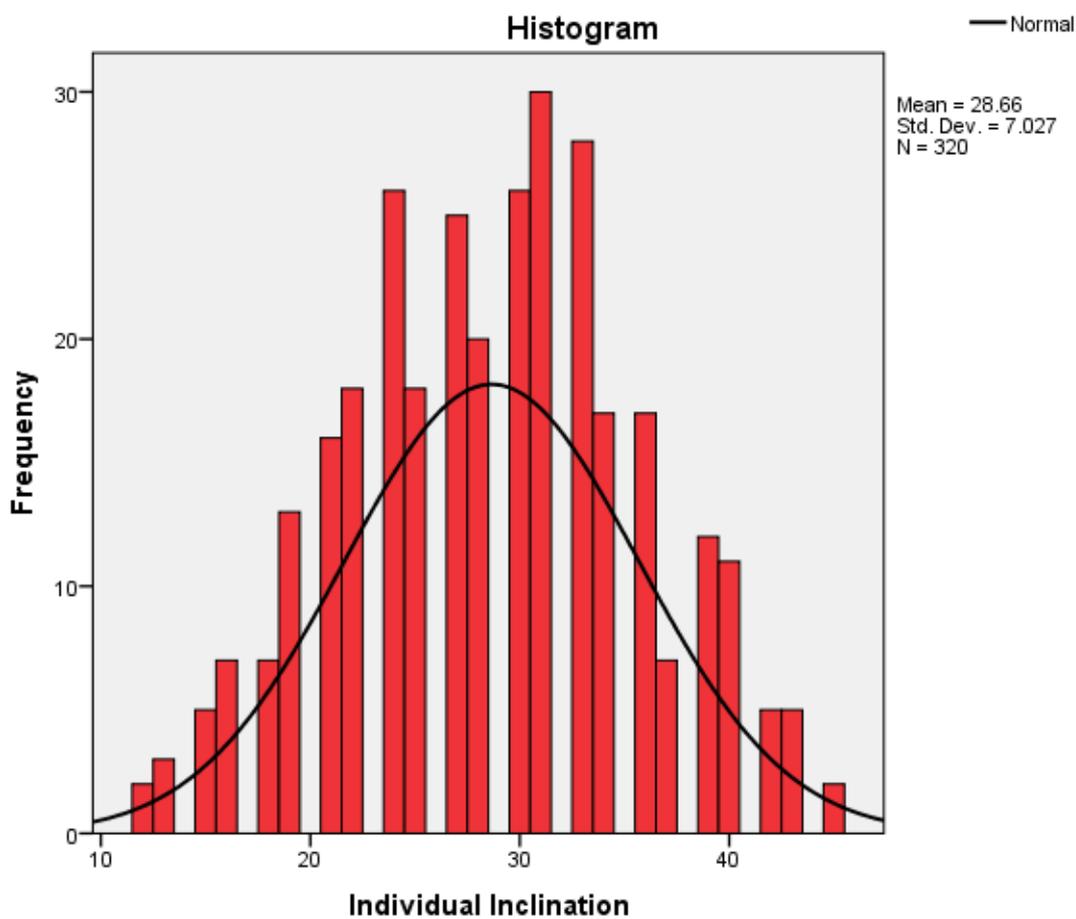


Figure 4.22: Histogram of the habit of individual inclination

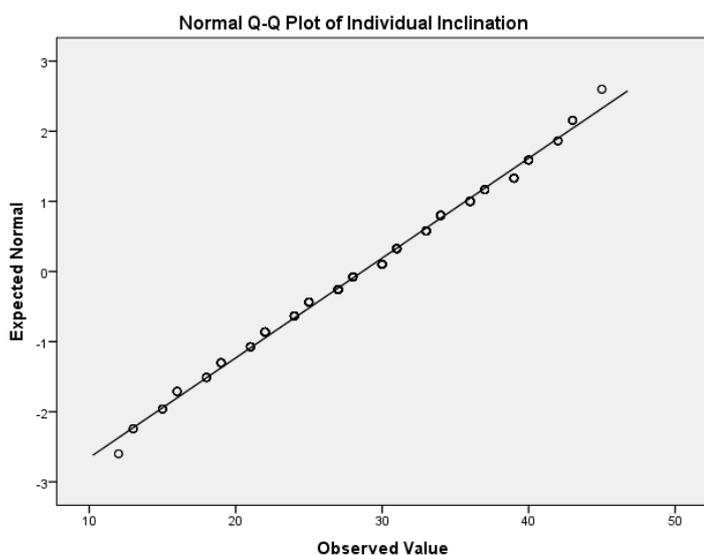


Figure 4.23: Normal Q-Q plot of the habit of individual inclination

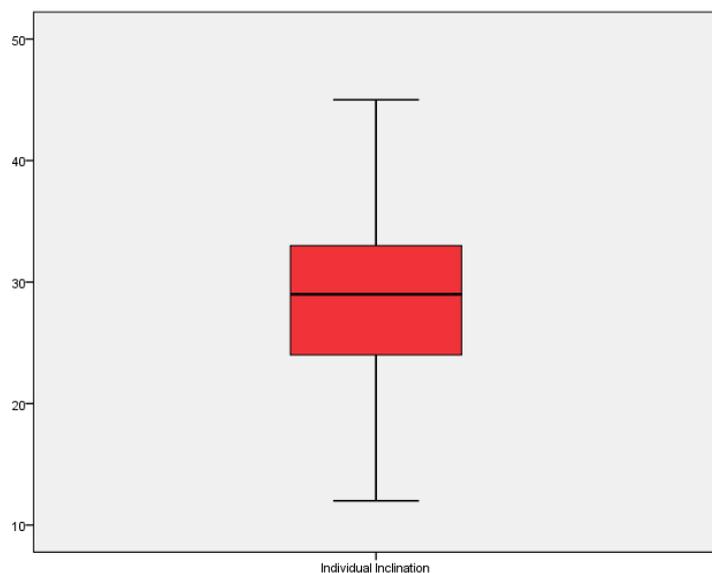


Figure 4.24: Boxplot of the habit of individual inclination

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

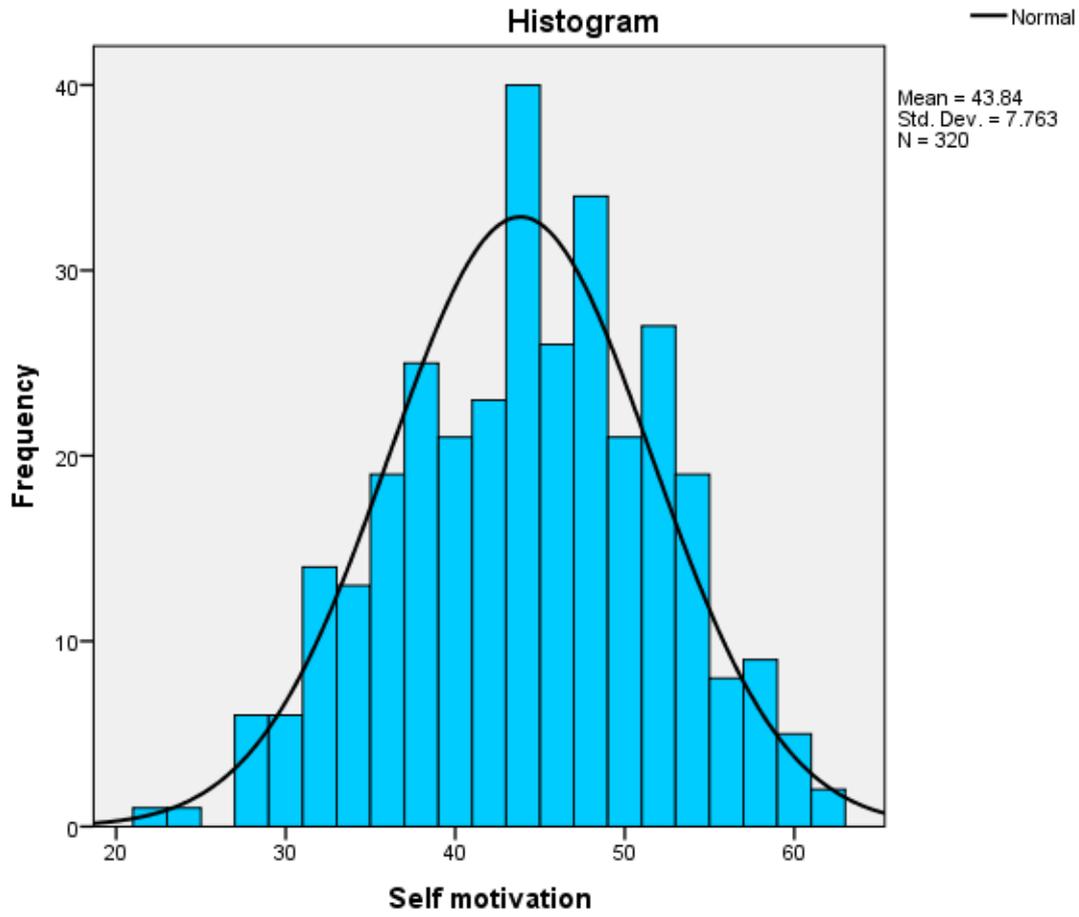


Figure 4.25: Histogram of the habit of self motivation

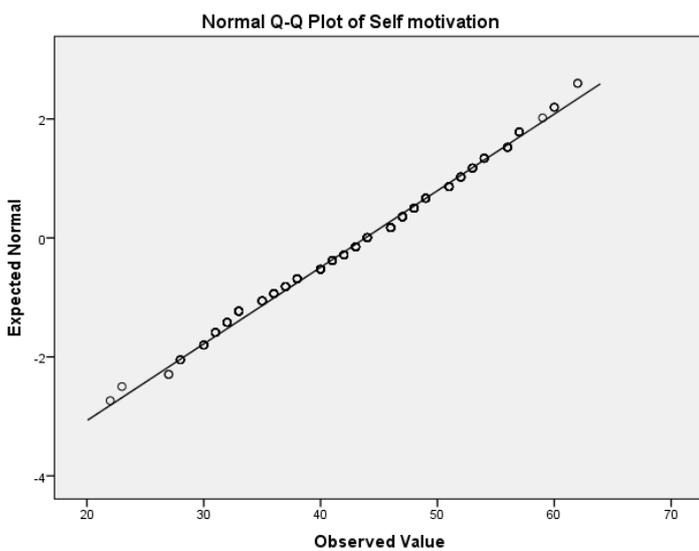


Figure 4.26: Normal Q-Q plot of the habit of self motivation

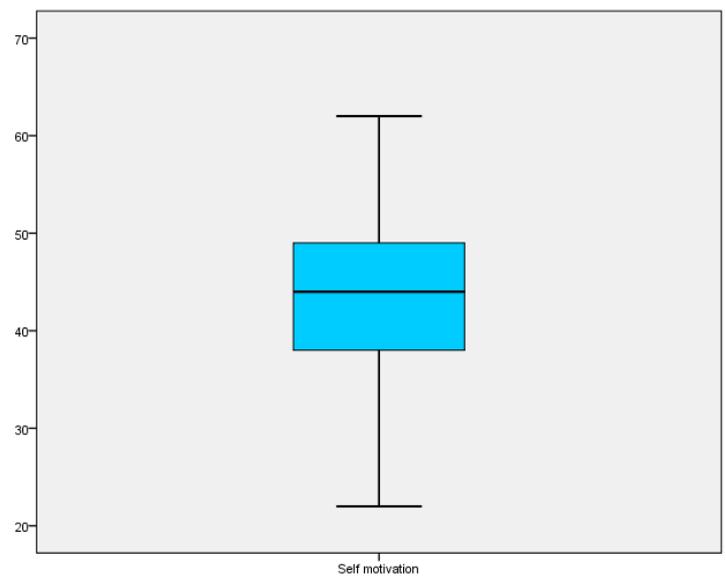


Figure 4.27: Boxplot of the habit of self motivation

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

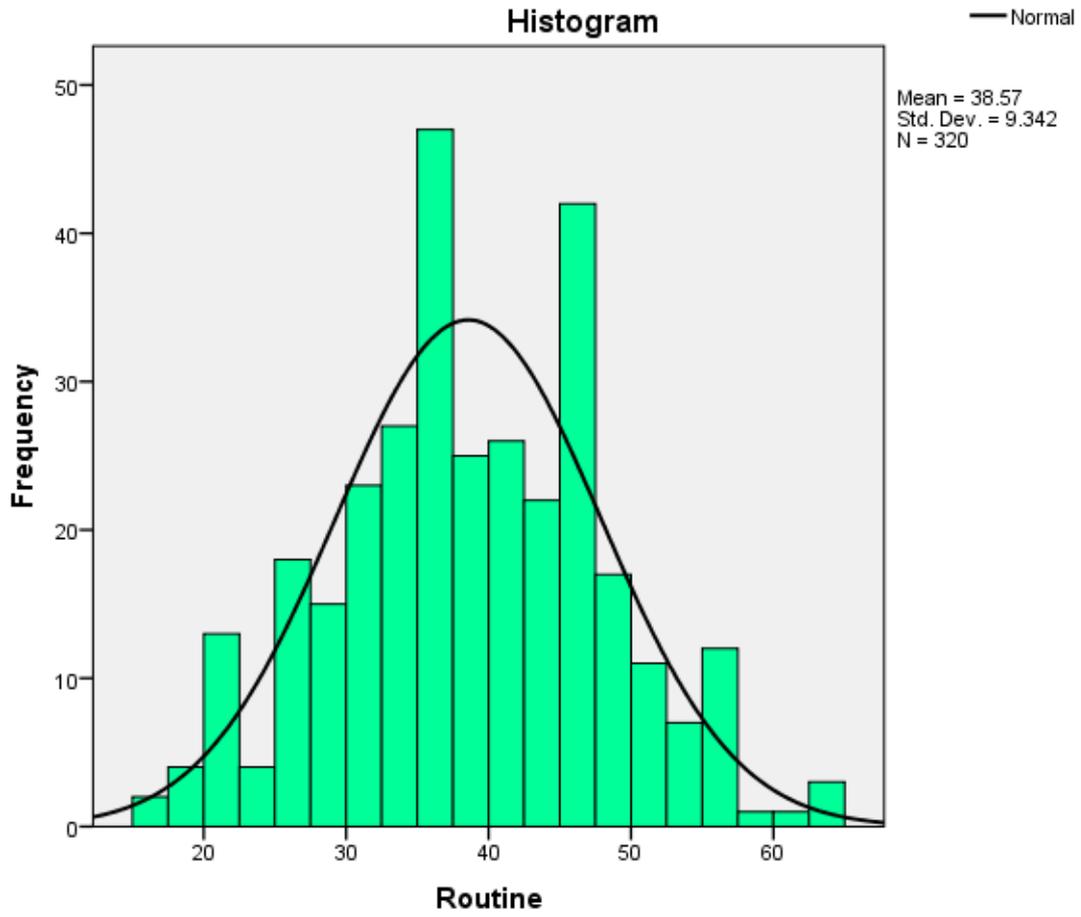


Figure 4.28: Histogram of the habit of routine

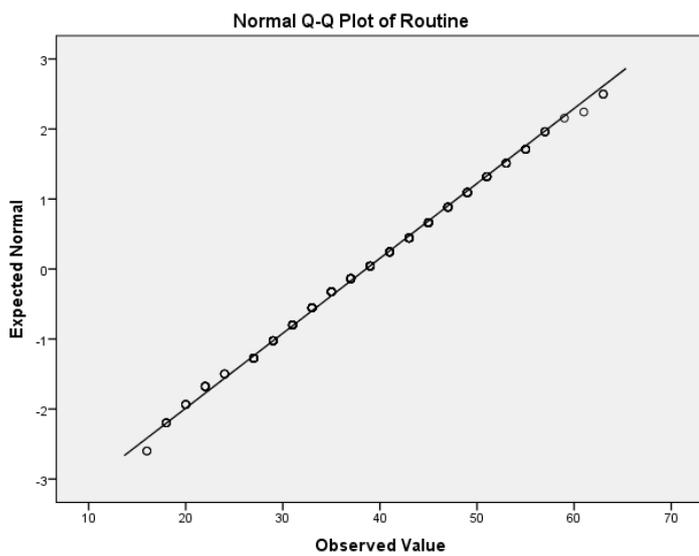


Figure 4.29: Normal Q-Q plot of the habit of routine

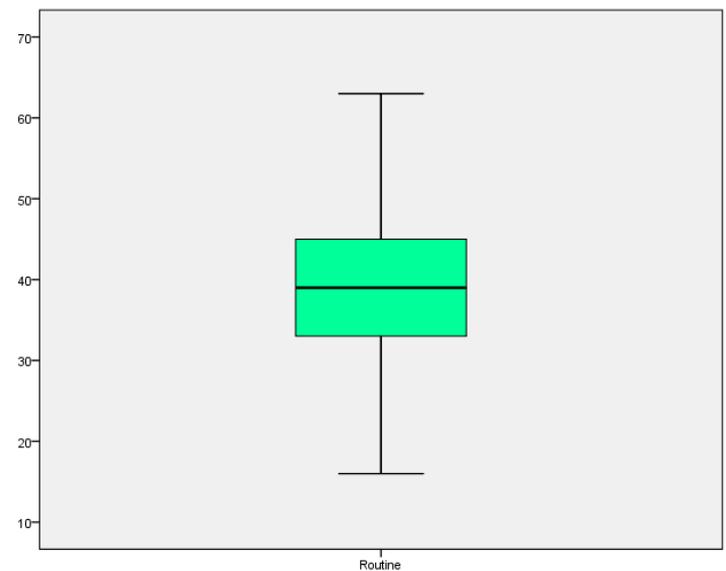


Figure 4.30: Boxplot of the habit of routine

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

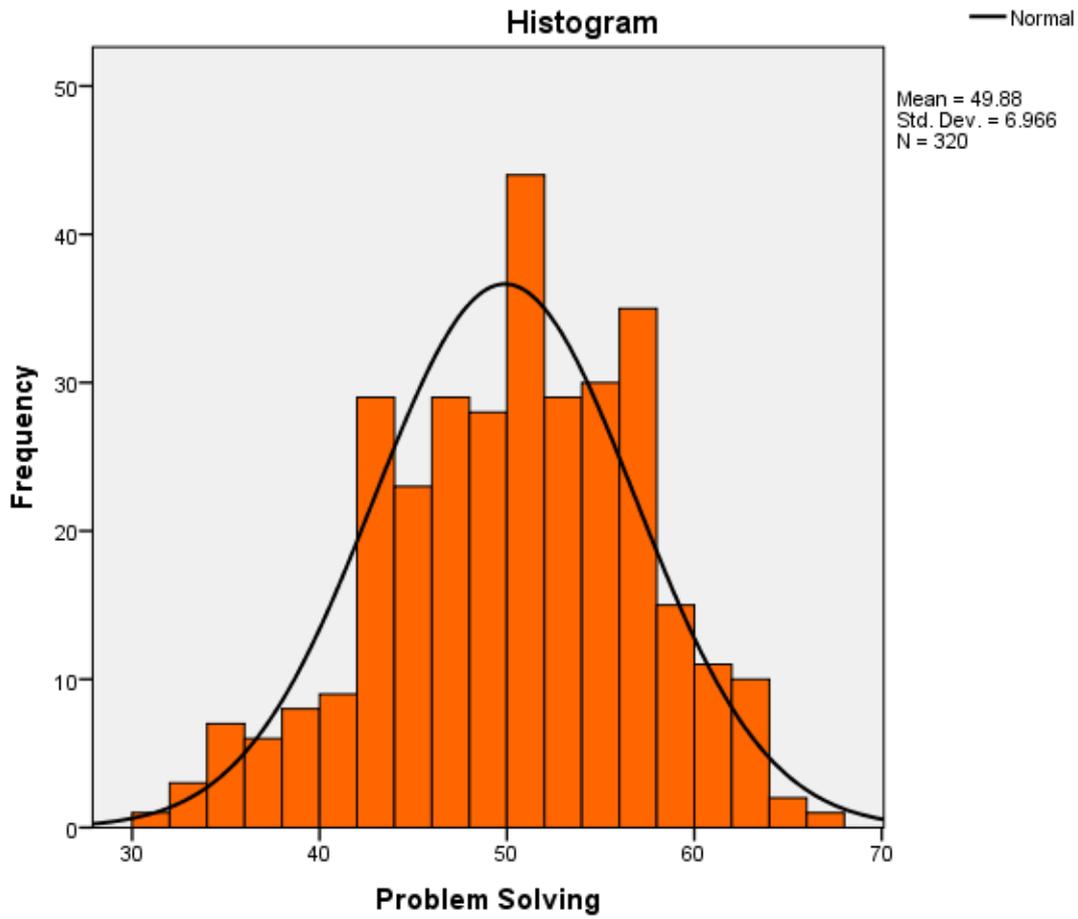


Figure 4.31: Histogram of the habit of problem solving

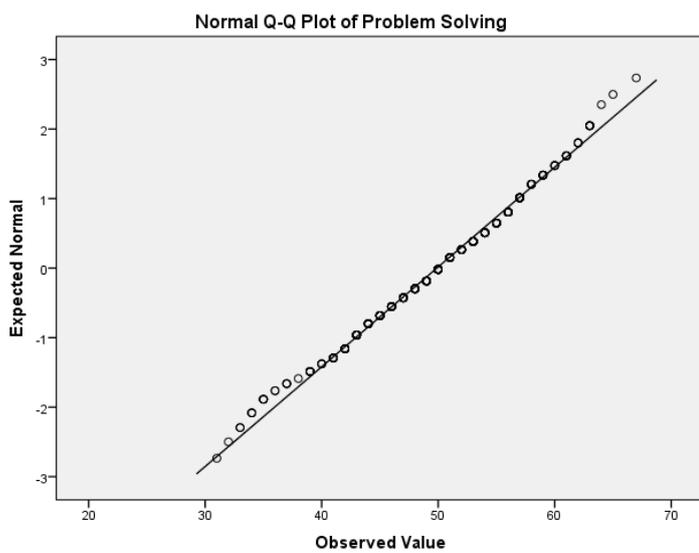


Figure 4.32: Normal Q-Q plot of the habit of problem solving

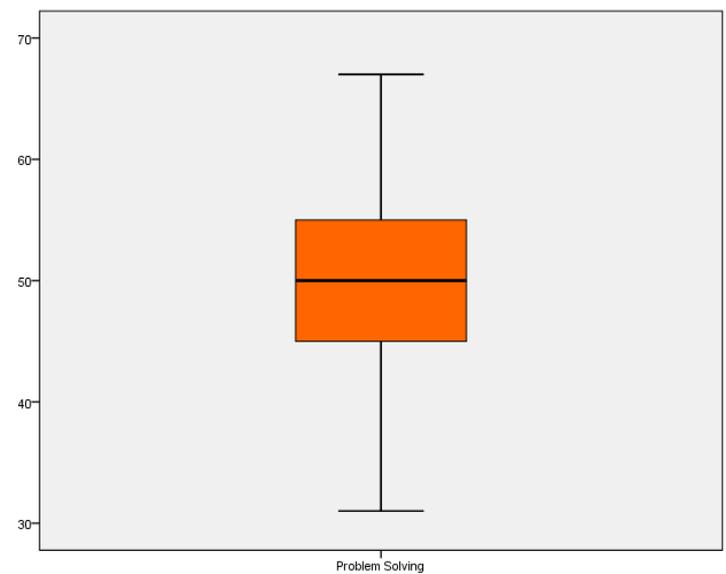


Figure 4.33: Boxplot of the habit of problem solving

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

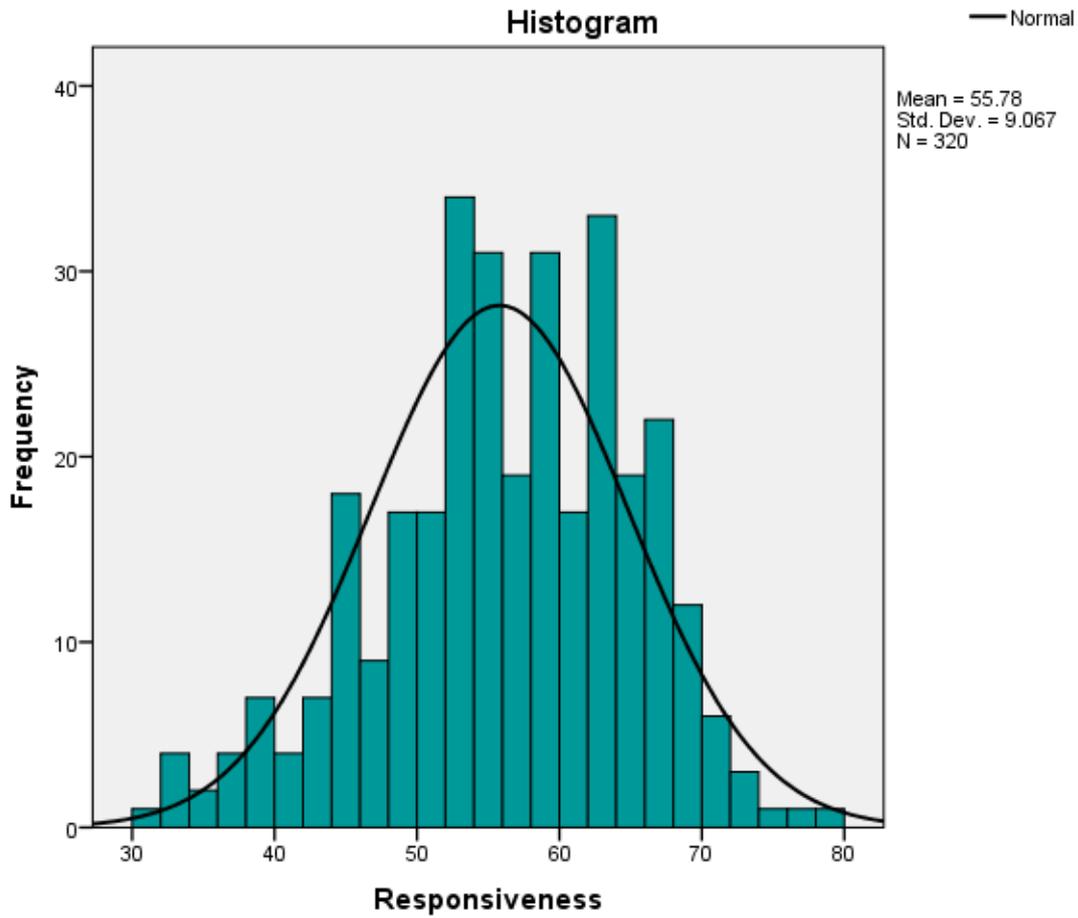


Figure 4.34: Histogram of the habit of responsiveness

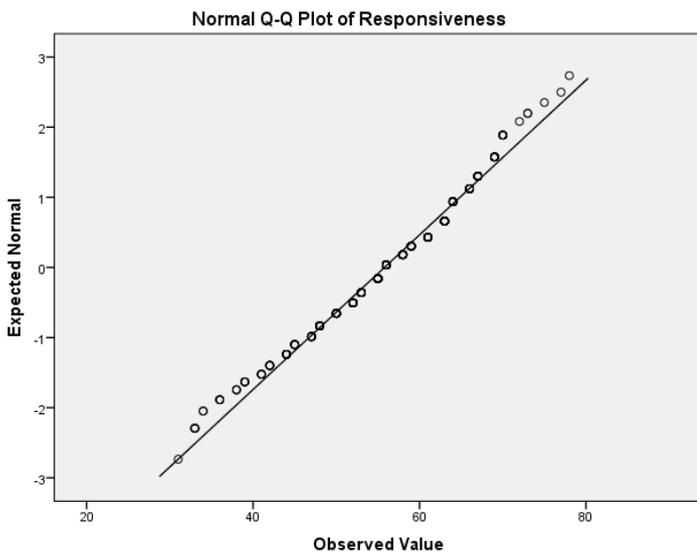


Figure 4.35: Normal Q-Q plot of the habit of responsiveness

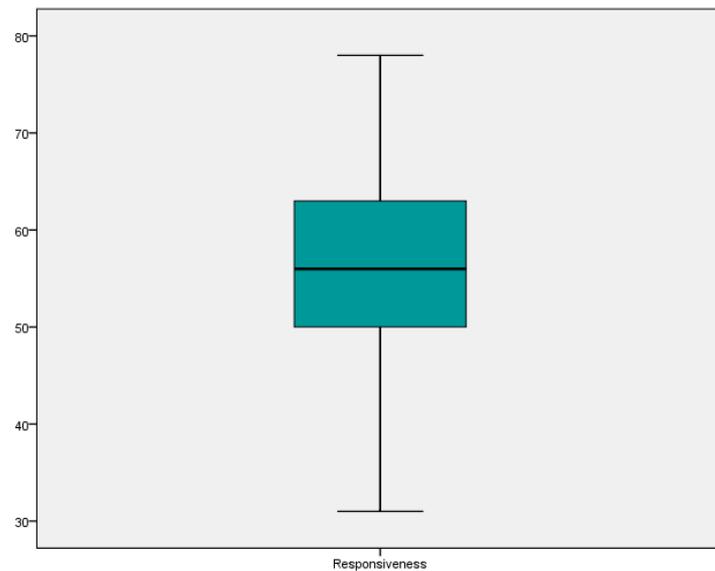


Figure 4.36: Boxplot of the habit of responsiveness

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

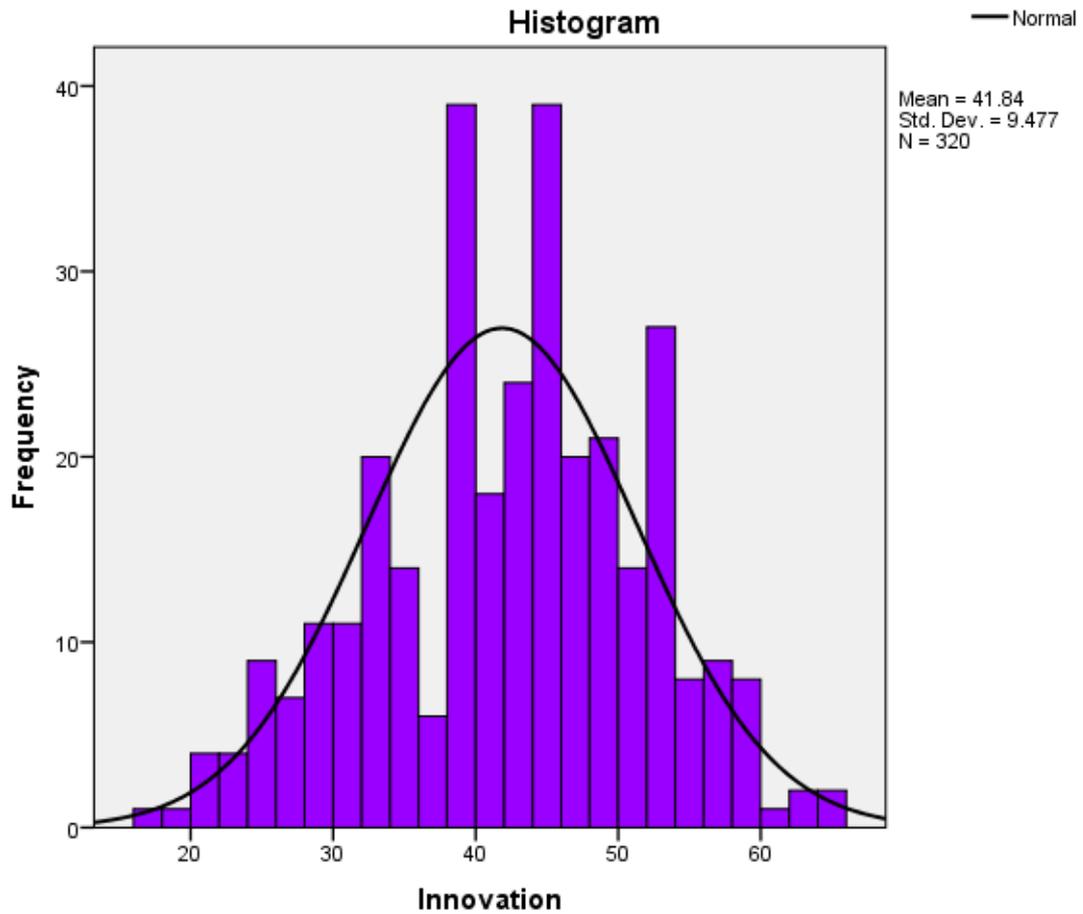


Figure 4.37: Histogram of the habit of innovation

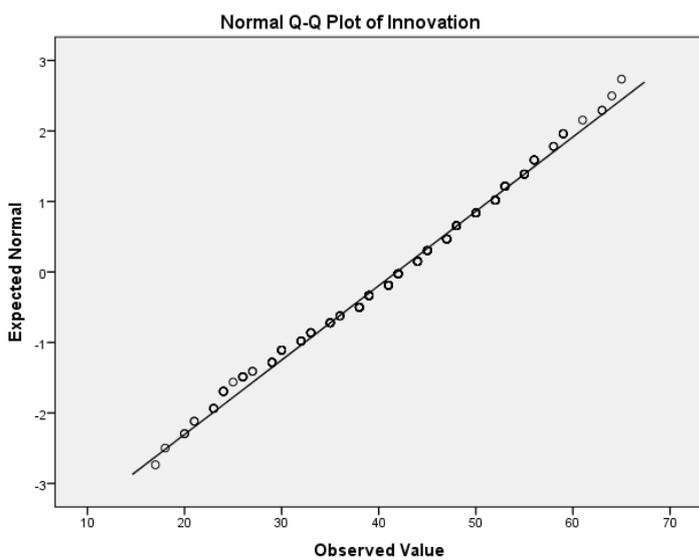


Figure 4.38: Normal Q-Q plot of the habit of innovation

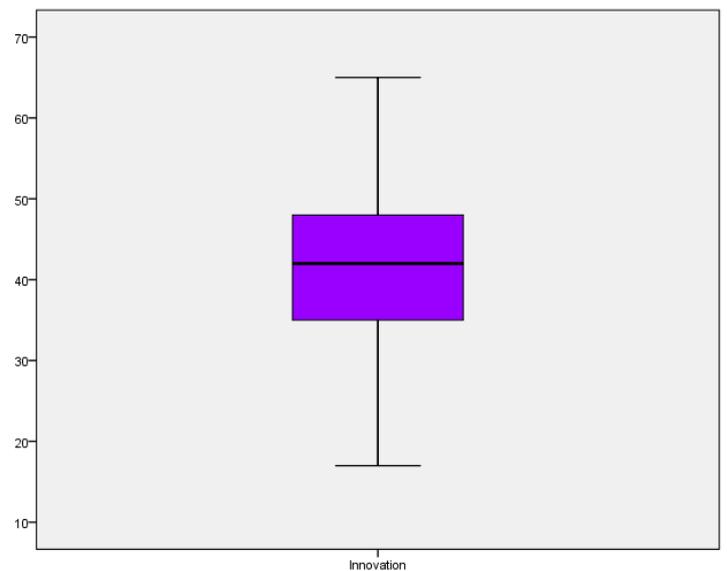


Figure 4.39: Boxplot of the habit of innovation

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

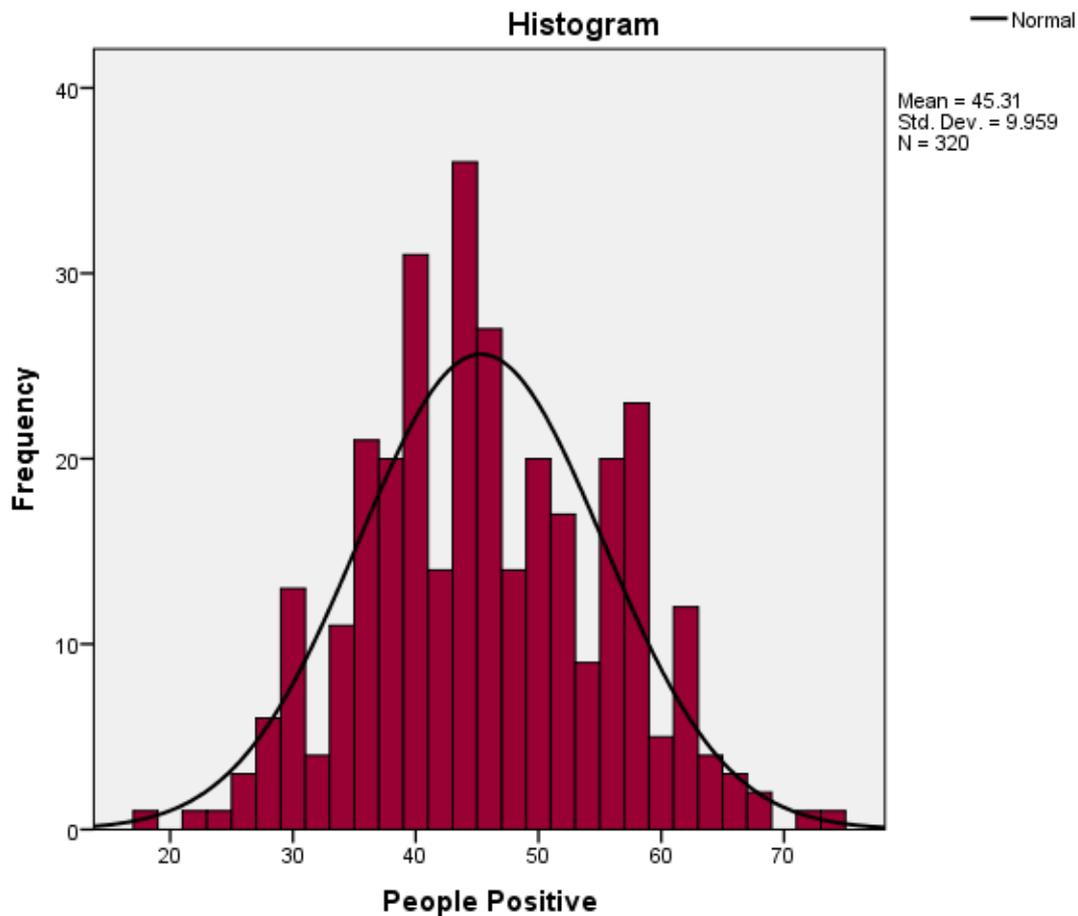


Figure 4.40: Histogram of the habit of people positive behaviour

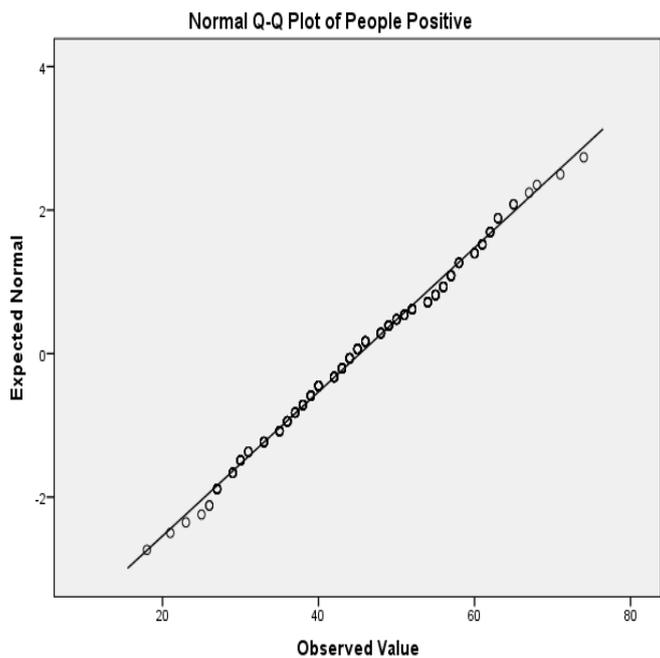


Figure 4.41: Normal Q-Q plot of the habit of people positive behaviour

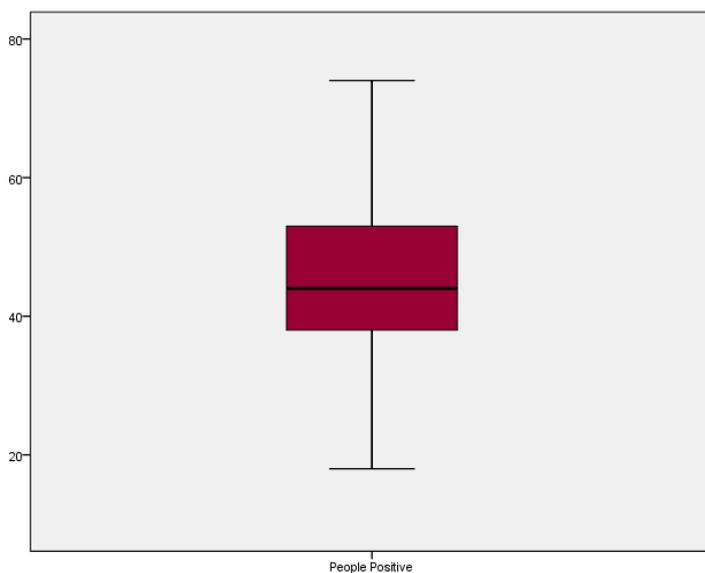


Figure 4.42: Boxplot of the habit of people positive behaviour

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

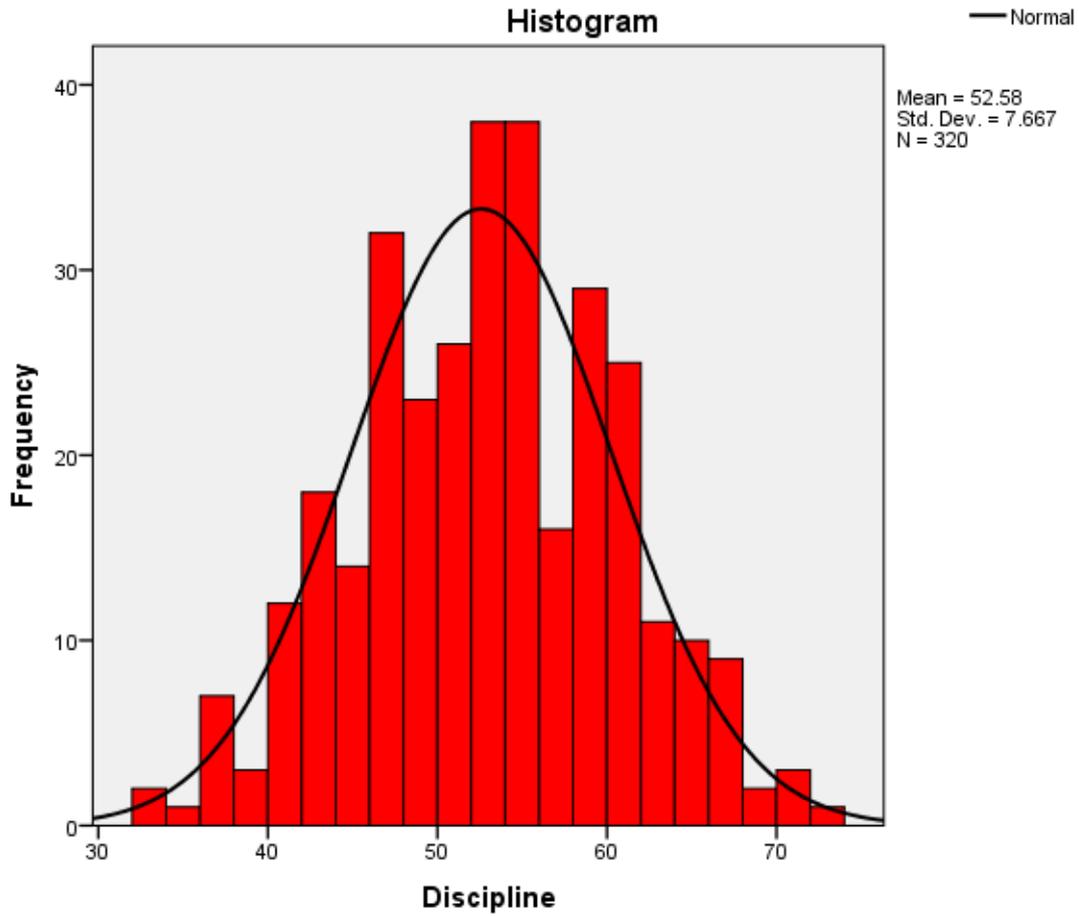


Figure 4.43: Histogram of the habit of discipline

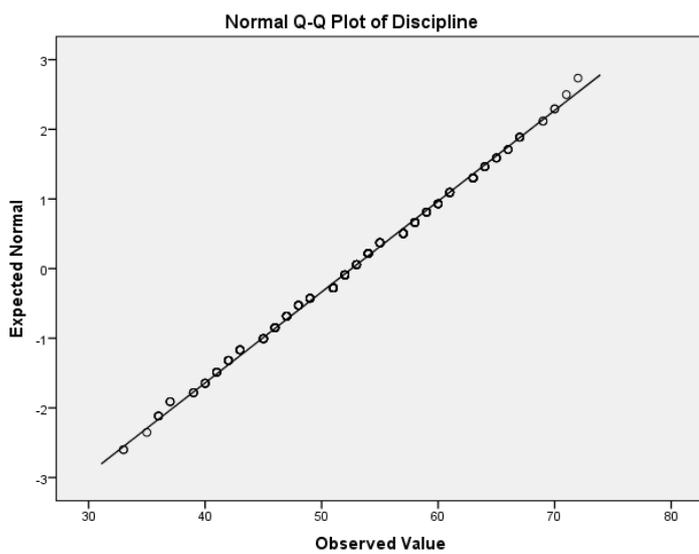


Figure 4.44: Normal Q-Q plot of the habit of discipline

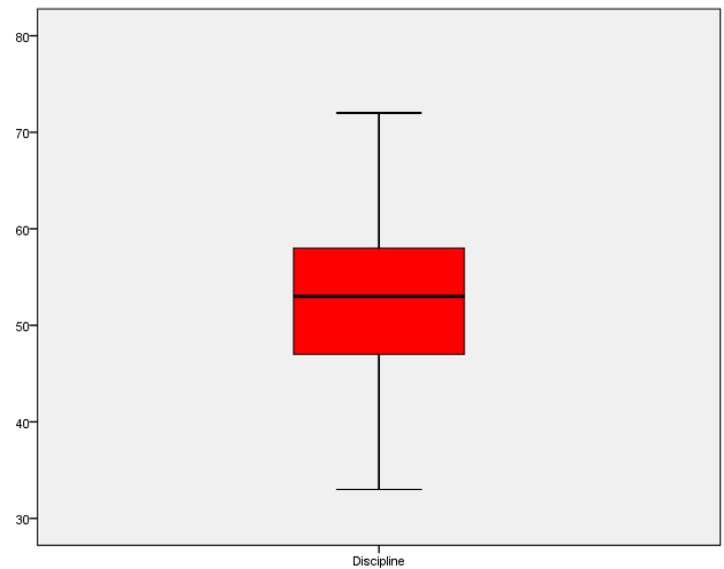


Figure 4.45: Boxplot of the habit of discipline

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

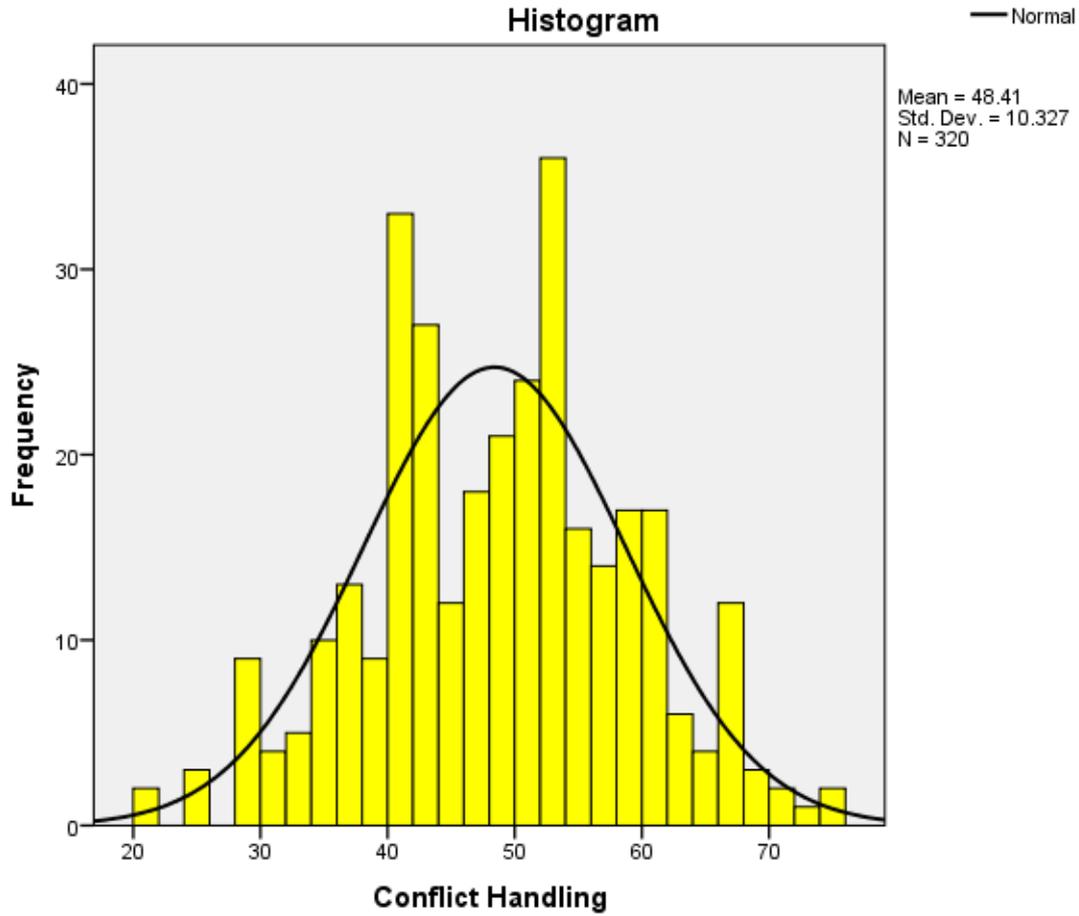


Figure 4.46: Histogram of the habit of conflict handling

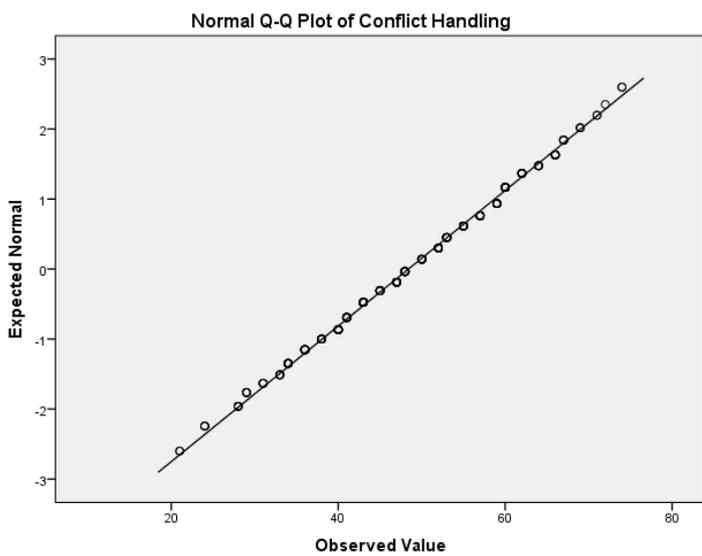


Figure 4.47: Normal Q-Q plot of the habit of conflict handling

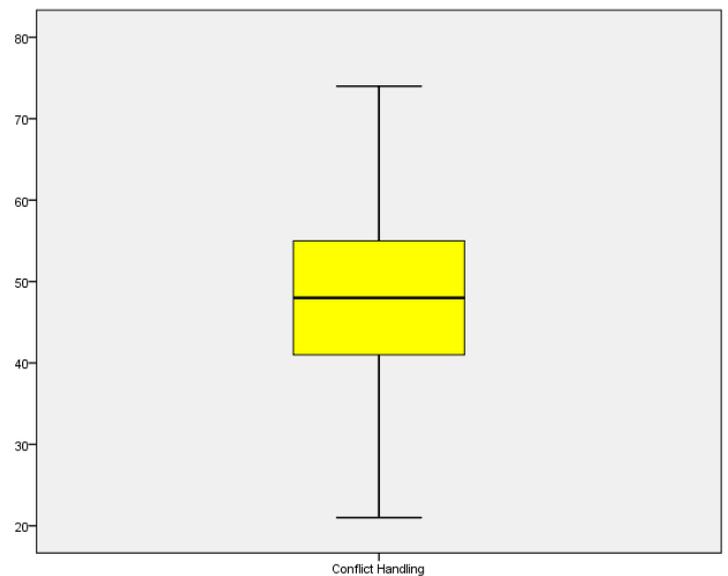


Figure 4.48: Boxplot of the habit of conflict handling

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

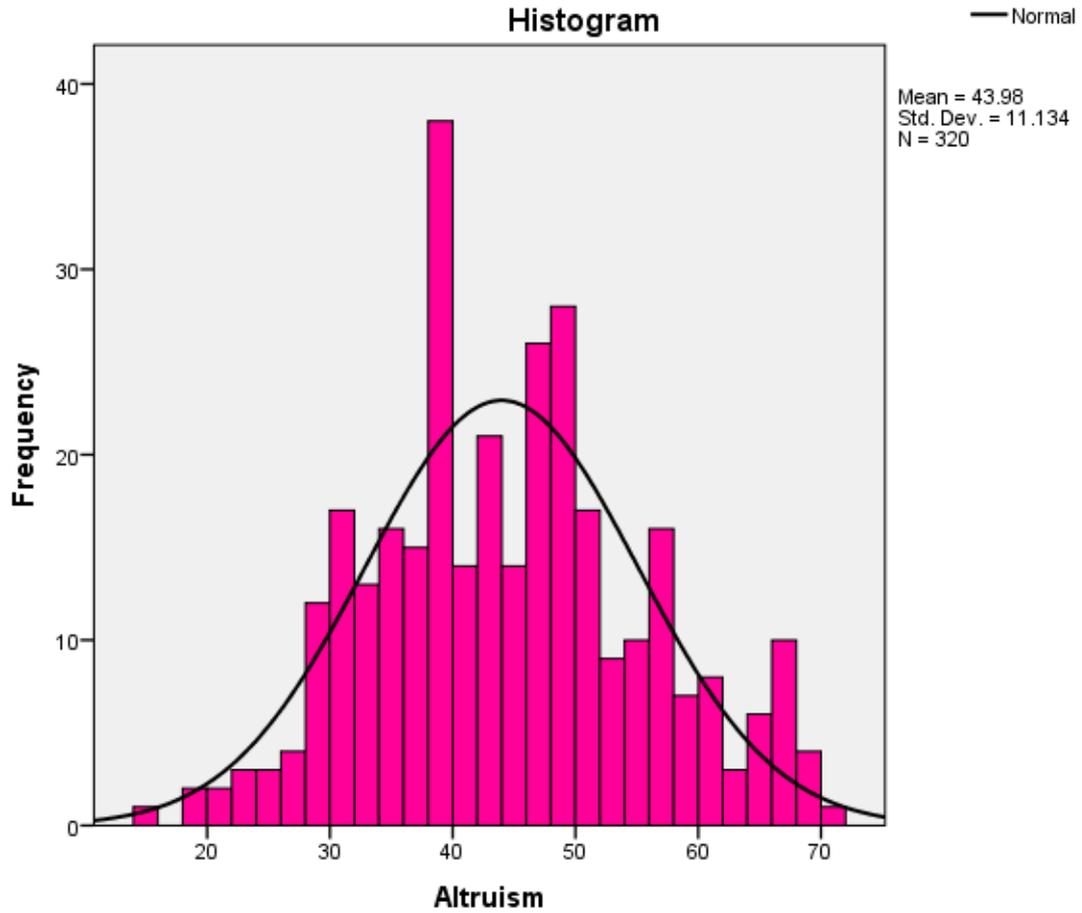


Figure 4.49: Histogram of the habit of altruism

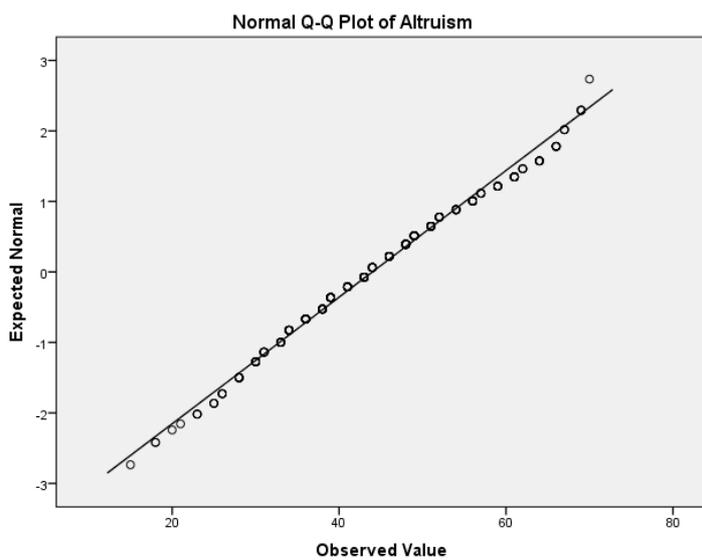


Figure 4.50: Normal Q-Q plot of the habit of altruism

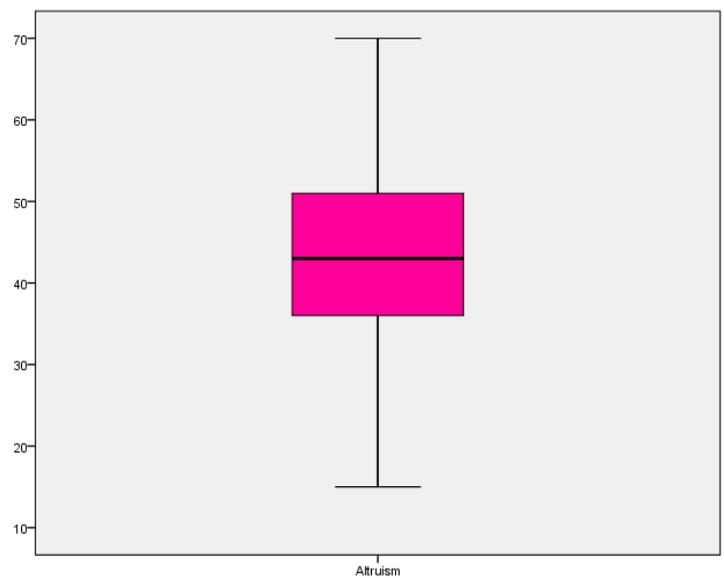


Figure 4.51: Boxplot of the habit of altruism

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

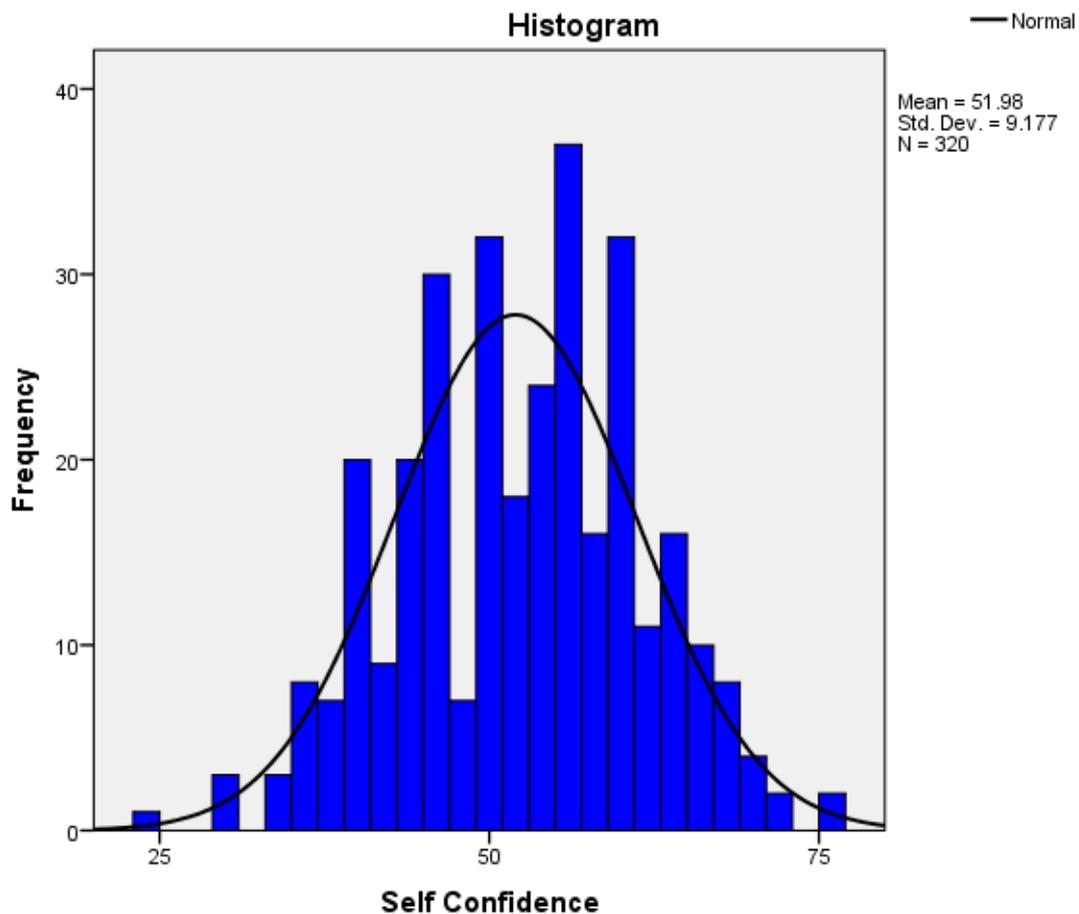


Figure 4.52: Histogram of the habit of self confidence

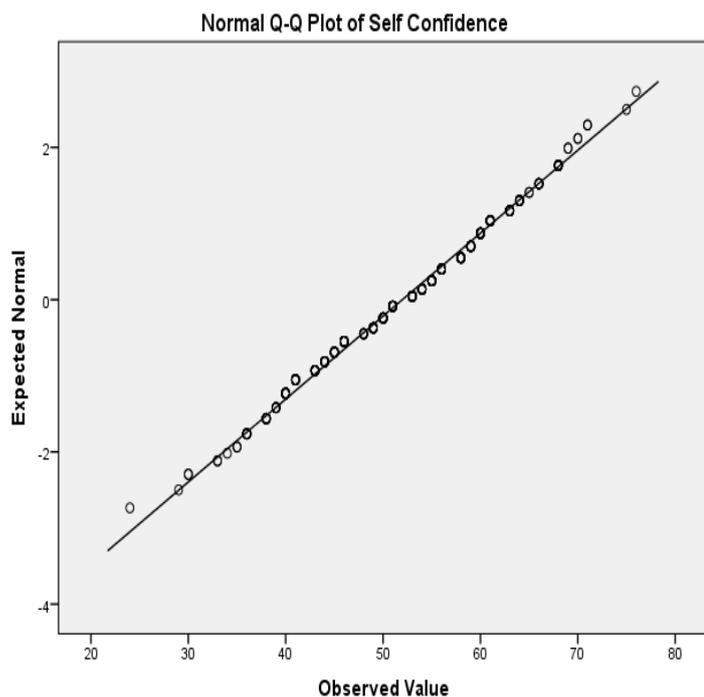


Figure 4.53: Normal Q-Q plot of the habit of self confidence

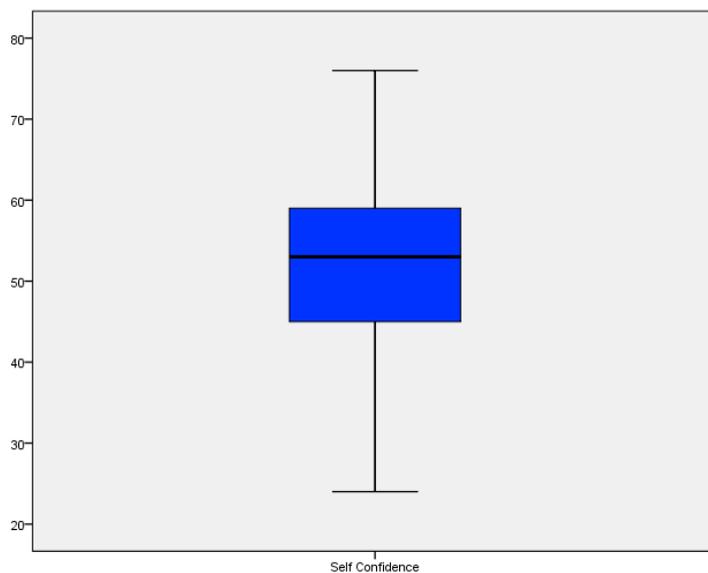


Figure 4.54: Boxplot of the habit of self confidence

COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

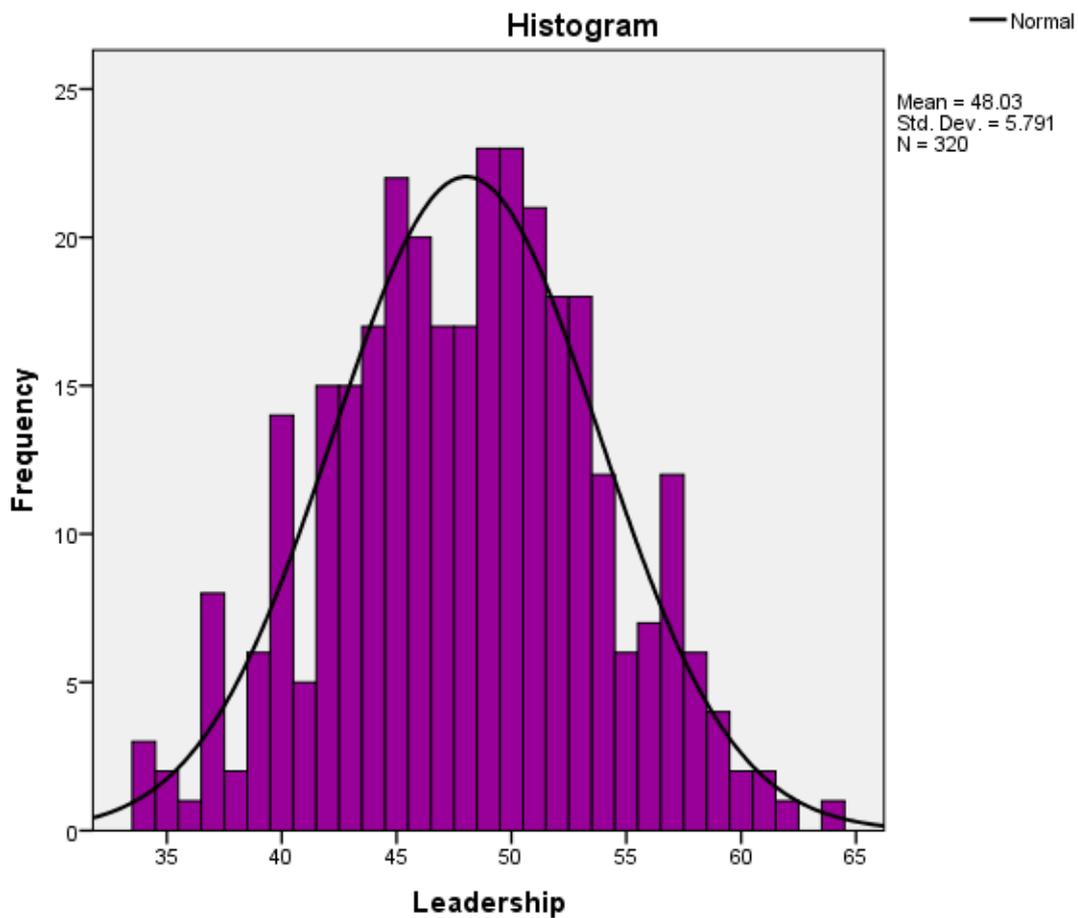


Figure 4.55: Histogram of the habit of leadership

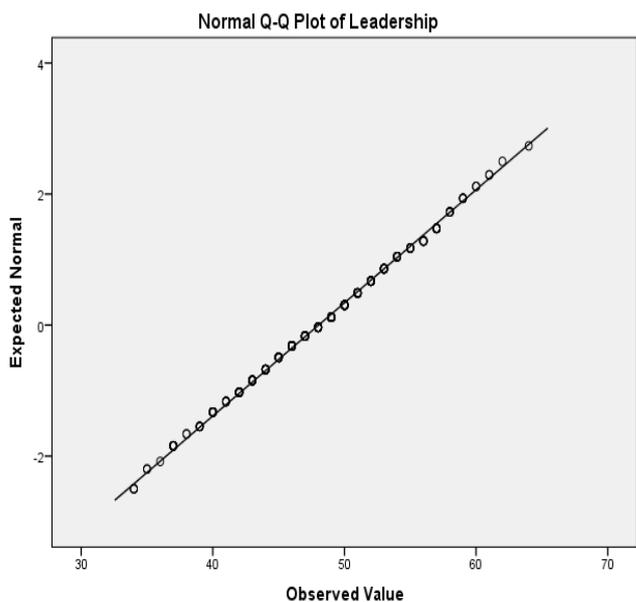


Figure 4.56: Normal Q-Q plot of the habit of leadership

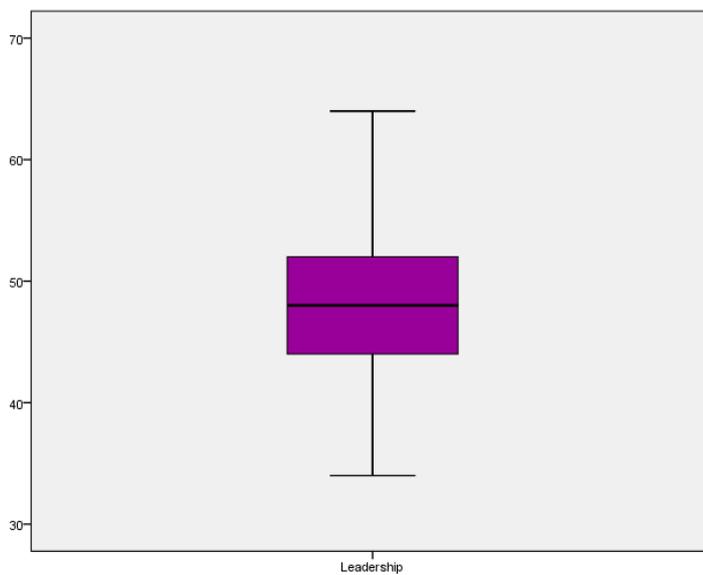


Figure 4.57: Normal Q-Q plot of the habit of leadership

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

## Appendix I: Correlation matrix of the 19 dependent variables

Table 4.27: Correlation matrix of the 19 dependent variables

		Correlations									
		Propensity to Own	Propensity to Hand-off	To Simplify	Resilience	Propensity to Change	Frustration Handling	Team Inclination	Individual Inclination	Self motivation	Routine
Problem Solving	Pearson Correlation	.441	-.407	.599	.614	.483	.397	.311	-.161	.540	-.010
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.004	.000	.852
	N	320	320	320	320	320	320	320	320	320	320
Responsiveness	Pearson Correlation	.526	-.476	.699	.439	.481	.335	.054	.098	.416	-.077
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.333	.080	.000	.172
	N	320	320	320	320	320	320	320	320	320	320
Innovation	Pearson Correlation	.630	-.536	.606	.321	.561	.127	-.155	.331	.351	-.297
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.023	.005	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320	320
People Positive	Pearson Correlation	.065	-.022	-.021	.517	.239	.707	.751	-.553	.296	.256
	Sig. (2-tailed)	.248	.697	.709	.000	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320	320
Discipline	Pearson Correlation	.299	-.257	.063	.621	.145	.614	.448	-.380	.601	.387
	Sig. (2-tailed)	.000	.000	.263	.000	.009	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320	320
Conflict Handling	Pearson Correlation	-.035	.110	.044	.450	.126	.687	.586	-.482	.203	.378
	Sig. (2-tailed)	.530	.049	.433	.000	.025	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320	320
Altruism	Pearson Correlation	.132	-.092	-.110	.510	.307	.665	.715	-.541	.366	.181
	Sig. (2-tailed)	.018	.101	.050	.000	.000	.000	.000	.000	.000	.001
	N	320	320	320	320	320	320	320	320	320	320
Self Confidence	Pearson Correlation	.414	-.359	.234	.633	.529	.307	.344	-.285	.623	-.245
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320	320
Leadership	Pearson Correlation	.376	-.295	.285	.845	.462	.575	.637	-.492	.729	.020
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.727
	N	320	320	320	320	320	320	320	320	320	320
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

Correlations										
		Problem Solving	Responsiveness	Innovation	People Positive	Discipline	Conflict Handling	Altruism	Self Confidence	Leadership
Problem Solving	Pearson Correlation	1	.714	.597	.299	.375	.248	.293	.595	.702
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Responsiveness	Pearson Correlation	.714	1	.687	.149	.211	.145	.088	.482	.554
	Sig. (2-tailed)	.000		.000	.008	.000	.009	.115	.000	.000
	N	320	320	320	320	320	320	320	320	320
Innovation	Pearson Correlation	.597	.687	1	-.064	.024	-.139	-.057	.430	.331
	Sig. (2-tailed)	.000	.000		.251	.675	.013	.312	.000	.000
	N	320	320	320	320	320	320	320	320	320
People Positive	Pearson Correlation	.299	.149	-.064	1	.550	.766	.858	.330	.568
	Sig. (2-tailed)	.000	.008	.251		.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Discipline	Pearson Correlation	.375	.211	.024	.550	1	.463	.554	.440	.707
	Sig. (2-tailed)	.000	.000	.675	.000		.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Conflict Handling	Pearson Correlation	.248	.145	-.139	.766	.463	1	.658	.189	.436
	Sig. (2-tailed)	.000	.009	.013	.000	.000		.000	.001	.000
	N	320	320	320	320	320	320	320	320	320
Altruism	Pearson Correlation	.293	.088	-.057	.858	.554	.658	1	.340	.561
	Sig. (2-tailed)	.000	.115	.312	.000	.000	.000		.000	.000
	N	320	320	320	320	320	320	320	320	320
Self Confidence	Pearson Correlation	.595	.482	.430	.330	.440	.189	.340	1	.818
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.001	.000		.000
	N	320	320	320	320	320	320	320	320	320
Leadership	Pearson Correlation	.702	.554	.331	.568	.707	.436	.561	.818	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	
	N	320	320	320	320	320	320	320	320	320

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

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

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

		Correlations								
		Problem Solving	Responsiveness	Innovation	People Positive	Discipline	Conflict Handling	Altruism	Self Confidence	Leadership
Propensity to Own	Pearson Correlation	.441	.526	.630	.065	.299	-.035	.132	.414	.376
	Sig. (2-tailed)	.000	.000	.000	.248	.000	.530	.018	.000	.000
	N	320	320	320	320	320	320	320	320	320
Propensity to Hand-off	Pearson Correlation	-.407	-.476	-.536	-.022	-.257	.110	-.092	-.359	-.295
	Sig. (2-tailed)	.000	.000	.000	.697	.000	.049	.101	.000	.000
	N	320	320	320	320	320	320	320	320	320
To Simplify	Pearson Correlation	.599	.699	.606	-.021	.063	.044	-.110	.234	.285
	Sig. (2-tailed)	.000	.000	.000	.709	.263	.433	.050	.000	.000
	N	320	320	320	320	320	320	320	320	320
Resilience	Pearson Correlation	.614	.439	.321	.517	.621	.450	.510	.633	.845
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Propensity to Change	Pearson Correlation	.483	.481	.561	.239	.145	.126	.307	.529	.462
	Sig. (2-tailed)	.000	.000	.000	.000	.009	.025	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Frustration Handling	Pearson Correlation	.397	.335	.127	.707	.614	.687	.665	.307	.575
	Sig. (2-tailed)	.000	.000	.023	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Team Inclination	Pearson Correlation	.311	.054	-.155	.751	.448	.586	.715	.344	.637
	Sig. (2-tailed)	.000	.333	.005	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Individual Inclination	Pearson Correlation	-.161	.098	.331	-.553	-.380	-.482	-.541	-.285	-.492
	Sig. (2-tailed)	.004	.080	.000	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Self motivation	Pearson Correlation	.540	.416	.351	.296	.601	.203	.366	.623	.729
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320
Routine	Pearson Correlation	-.010	-.077	-.297	.256	.387	.378	.181	-.245	.020
	Sig. (2-tailed)	.852	.172	.000	.000	.000	.000	.001	.000	.727
	N	320	320	320	320	320	320	320	320	320
**. Correlation is significant at the 0.01 level (2-tailed).										
*. Correlation is significant at the 0.05 level (2-tailed).										

## COMPARISON OF BEHAVIOURAL PATTERNS OF ACHIEVERS

		Correlations									
		Propensity to Own	Propensity to Hand-off	To Simplify	Resilience	Propensity to Change	Frustration Handling	Team Inclination	Individual Inclination	Self motivation	Routine
Propensity to Own	Pearson Correlation	1	-.780	.355	.458	.487	.340	-.131	.360	.539	-.148
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.019	.000	.000	.008
	N	320	320	320	320	320	320	320	320	320	320
Propensity to Hand-off	Pearson Correlation	-.780	1	-.237	-.362	-.418	-.233	.177	-.311	-.450	.174
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.002	.000	.000	.002
	N	320	320	320	320	320	320	320	320	320	320
To Simplify	Pearson Correlation	.355	-.237	1	.235	.299	.148	-.086	.159	.150	-.026
	Sig. (2-tailed)	.000	.000		.000	.000	.008	.125	.004	.007	.642
	N	320	320	320	320	320	320	320	320	320	320
Resilience	Pearson Correlation	.458	-.362	.235	1	.433	.695	.492	-.328	.665	.102
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.069
	N	320	320	320	320	320	320	320	320	320	320
Propensity to Change	Pearson Correlation	.487	-.418	.299	.433	1	.294	.124	.049	.476	-.297
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.026	.382	.000	.000
	N	320	320	320	320	320	320	320	320	320	320
Frustration Handling	Pearson Correlation	.340	-.233	.148	.695	.294	1	.487	-.300	.452	.329
	Sig. (2-tailed)	.000	.000	.008	.000	.000		.000	.000	.000	.000
	N	320	320	320	320	320	320	320	320	320	320
Team Inclination	Pearson Correlation	-.131	.177	-.086	.492	.124	.487	1	-.769	.282	.105
	Sig. (2-tailed)	.019	.002	.125	.000	.026	.000		.000	.000	.060
	N	320	320	320	320	320	320	320	320	320	320
Individual Inclination	Pearson Correlation	.360	-.311	.159	-.328	.049	-.300	-.769	1	-.134	-.105
	Sig. (2-tailed)	.000	.000	.004	.000	.382	.000	.000		.017	.061
	N	320	320	320	320	320	320	320	320	320	320
Self motivation	Pearson Correlation	.539	-.450	.150	.665	.476	.452	.282	-.134	1	-.112
	Sig. (2-tailed)	.000	.000	.007	.000	.000	.000	.000	.017		.046
	N	320	320	320	320	320	320	320	320	320	320
Routine	Pearson Correlation	-.148	.174	-.026	.102	-.297	.329	.105	-.105	-.112	1
	Sig. (2-tailed)	.008	.002	.642	.069	.000	.000	.060	.061	.046	
	N	320	320	320	320	320	320	320	320	320	320

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

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