



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

**THE CONSTRUCT VALIDITY OF THE LIFE-STYLE QUESTIONNAIRE  
IN THE SOUTH AFRICAN CONTEXT**

by

**AIMEE ESTERHUYZEN**

Submitted in partial fulfilment of the requirements for the degree

**MAGISTER COMMERCII  
(INDUSTRIAL PSYCHOLOGY)**

in the

**DEPARTMENT OF HUMAN RESOURCE MANAGEMENT**

at the

**UNIVERSITY OF PRETORIA  
FACULTY OF ECONOMIC AND MANAGEMENT SCIENCES**

**SUPERVISOR: MR. M. BUYS**

**APRIL 2011**

## ACKNOWLEDGEMENTS

In completion of this study, I would like to express my gratitude to the following individuals - without whom, this study would not have been possible:

- Mr Buys of the University of Pretoria, my supervisor, for all his guidance and patience;
- Ms Rina Owen of the University of Pretoria for her contribution to the data analysis;
- Aretha Schultz for contributing to this study through her expert language editing and formatting knowledge;
- all the participants who completed the questionnaire and their willingness to cooperate in this study;
- my mother and brother, for their unconditional support and all the sacrifices they have made to bring me where I am today;
- my family and employer for all the support and assistance offered; and
- my Creator, for giving me the insight and knowledge to have completed this study.

## DECLARATION OF ORIGINAL AUTHORSHIP

I, Aimee Esterhuyzen, declare that *“The Construct Validity of the Life-Style Questionnaire in the South African Context”* is my own work. All the resources I have used for this study are sited and referred to in the list of reference by means of a comprehensive referencing system. I declare that the content of this dissertation has never before been used for any qualification at any other tertiary institute.

---

AIMEE ESTERHUYZEN

---

DATE

## ABSTRACT

### THE CONSTRUCT VALIDITY OF THE LIFE-STYLE QUESTIONNAIRE IN THE SOUTH AFRICAN CONTEXT

by

**Aimee Esterhuyzen**

**SUPERVISOR:** Mr. M Buys  
**FACULTY:** Economic and Management Sciences  
**DEGREE:** Magister Commercii (Industrial Psychology)

The study of construct validity is particularly relevant in the twenty-first century, as more and more entities in South Africa are using psychometric instruments – instruments which have to be valid and reliable in accordance with the requirements of the Health Professions Council of South Africa (HPCSA). Even though validity and reliability, together with their accompanying aspects, are the two main considerations of a psychometric instrument, the construct validity of an instrument is one of the most important aspects to consider. This study's focus is therefore, for the most part, based on the construct validity of the Life-Style Questionnaire.

Even though the Life-Style Questionnaire is not a very distinguished questionnaire in the South African context, it is, however, a classified and useable questionnaire to determine into which of the five trait-descriptive lifestyle categories an individual belongs. In recent years, the Professional Board has become increasingly concerned about the misuse of assessment measures in South Africa, while recognising the important role of psychological assessment in the professional practice of psychology, as well as for research purposes (Foxcroft & Roodt, 2005:20). The need therefore existed to determine whether or not the Life-Style Questionnaire actually measures what it is supposed to measure, in other words to determine its construct validity.

“The Life-Style Questionnaire was developed as an objective means to measure into which of five trait-descriptive lifestyle categories (*aggressive,*

*conforming, defensive, individualistic, or resistive*) participants belong” (Driscoll & Eckstein, 2007:1).

The purpose of this study was to determine the construct validity of the Life-Style Questionnaire, developed by Driscoll and Eckstein, in the South African context. A quantitative descriptive survey design was used to conduct the research. The Life-Style Questionnaire was administered to a non-probability convenience sample consisting of 301 individuals living in South Africa and the results were subjected to factor analysis (FA), item analysis and confirmatory factor analysis (CFA).

Various iterations of the (FA) indicated the primary factors for each of the components of the Life-Style Questionnaire. The final FA yielded a questionnaire consisting of five factors. This was confirmed through Kaiser’s eigenvalues and Cattell’s scree plot. The item analysis indicated that it should be considered to remove items 2, 3, 5, 7, 12, 27, 28, 30 and 32 from the Life-Style Questionnaire. After the factor and item analysis, a CFA was conducted. The purpose of the CFA was to determine whether the postulated theoretical model actually fits the observed data. The most common test used to measure the goodness-of-fit of an instrument is the chi-square test. The chi-square test was conducted by using the EQS programme. The results indicated a poor model fit. However, the reliability of the Life-Style Questionnaire was determined and a Cronbach alpha of 0.853 established the instrument’s high level of reliability. Thus, the Life-Style Questionnaire is a reliable, but invalid instrument.

This research study contributed to the understanding and importance of construct validity in psychological instruments. It is important to realise that instruments do not necessarily measure what they are intended to measure and therefore they have to be investigated. Lastly, this study not only emphasises the importance of psychometric properties of psychological instruments, but also the important role that psychometrists and industrial psychologists play with regard to the development and use such instruments.

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
DECLARATION OF ORIGINAL AUTHORSHIP	ii
ABSTRACT	iii
<b>CHAPTER 1: INTRODUCTION AND BACKGROUND</b>	<b>1</b>
1.1 INTRODUCTION	1
1.2 BACKGROUND TO THE STUDY	1
1.3 RESEARCH PROBLEM	2
1.4 PURPOSE AND SIGNIFICANCE OF THE STUDY	4
1.5 CHAPTER OUTLINE	6
1.6 SUMMARY AND CONCLUDING REMARKS	7
<b>CHAPTER 2: PERSONALITY AND LIFESTYLE OF AN INDIVIDUAL</b>	<b>9</b>
2.1 INTRODUCTION	9
2.2 ALFRED ADLER'S LIFESTYLE THEORY	9
2.2.1 Striving for Superiority and perfection	11
2.2.2 Inferiority Feeling	12
2.2.3 Goal of Life	13
2.2.4 Lifestyle Theory	13
2.3 THE LIFESTYLE OF AN INDIVIDUAL	16
2.3.1 Defining Lifestyle	16
2.3.2 Lifestyle in the Context of the Life-Style Questionnaire	17
2.4 TRAIT-DESCRIPTIVE LIFESTYLE CATEGORIES	20
2.4.1 Traits	20
2.4.2 The Aggressive Trait	25
2.4.3 The Conforming Trait	28
2.4.4 The Defensive Trait	31
2.4.5 The Individualistic Trait	32
2.4.6 The Resistive Trait	33
2.5 SUMMARY	34

<b>CHAPTER 3: VALIDITY, CONSTRUCT VALIDITY AND RELIABILITY</b>	<b>35</b>
3.1 INTRODUCTION	35
3.2 OVERVIEW OF CONSTRUCT VALIDITY	35
3.3 DEFINING VALIDITY AND CONSTRUCT VALIDITY	37
3.3.1 Validity	37
3.3.2 Construct Validity	39
3.4 THE IDEA AND LOGIC OF CONSTRUCT VALIDATION	44
3.5 CONSTRUCT VALIDITY IN PERSONALITY RESEARCH	45
3.5.1 Construct Validity in Psychological Tests	46
3.6 COMMON THREATS TO CONSTRUCT VALIDITY	46
3.7 RELIABILITY	48
3.8 SUMMARY	49
<b>CHAPTER 4: RESEARCH METHODOLOGY AND METHODS</b>	<b>51</b>
4.1 INTRODUCTION	51
4.2 RESEARCH DESIGN	51
4.2.1 A Description of the Study's Strategy of Inquiry	51
4.2.2 The Basic Characteristics of Quantitative Research	52
4.2.3 Surveys as a form of Quantitative Research	54
4.3 SAMPLE	55
4.3.1 Target Population, Context and Units of Analysis	55
4.3.2 Sampling Method	56
4.3.3 Sampling Size	57
4.3.4 Sampling Error	58
4.4 DATA COLLECTION AND INSTRUMENT	58
4.4.1 Survey Methods	58
4.4.2 Measurement Instrument	59
4.4.3 Preparation of Data Analysis	60
4.4.4 Reliability	61
4.4.5 Validity and Construct Validity	63
4.5 RESEARCH ETHICS	63

4.6	STATISTICAL DATA ANALYSIS	64
4.6.1	Descriptive Statistics	65
4.6.1.1	<i>Measures of Central Tendency</i>	65
4.6.1.2	<i>Measures of Dispersion</i>	66
4.6.1.3	<i>Measures of Shape</i>	66
4.6.2	Reliability	67
4.6.2.1	<i>Types of Reliability</i>	69
4.6.3	Item Analysis	70
4.6.4	Factor Analysis (FA)	70
4.6.5	Confirmatory Factor Analysis (CFA)	75
4.6.6	Structural Equation Modeling (SEM)	78
4.6.7	Estimation and Model Fit	79
4.6.7.1	<i>Estimation</i>	79
4.6.7.2	<i>Model Fit: Goodness-of-Fit Indices</i>	79
4.6.7.3	<i>Modification Indices</i>	82
4.7	SUMMARY AND CONCLUDING REMARKS	83
<b>CHAPTER 5:</b>	<b>RESULTS AND DISCUSSION</b>	<b>84</b>
5.1	INTRODUCTION	84
5.2	PARTICIPANTS	84
5.2.1	Biographical Variables of the Participants	84
5.2.1.1	<i>Language</i>	84
5.2.1.2	<i>Ethnic Group</i>	85
5.2.1.3	<i>Age</i>	85
5.3	FACTOR ANALYSIS	86
5.3.1	Final Factor Solution and Loadings, and Scale Description	96
5.3.1.1	<i>Factor 1</i>	96
5.3.1.2	<i>Factor 2</i>	97
5.3.1.3	<i>Factor 3</i>	98
5.3.1.4	<i>Factor 4</i>	99
5.3.1.5	<i>Factor 5</i>	100
5.4	RELIABILITY	101



5.5	ITEM ANALYSIS	102
5.5.1	Factor 1	102
5.5.2	Factor 2	104
5.5.3	Factor 3	107
5.5.4	Factor 4	108
5.5.5	Factor 5	110
5.6	CONFIRMATION FACTOR ANALYSIS	113
5.7	SUMMARY AND CONCLUDING REMARKS	119
<b>CHAPTER 6: CONCLUSION AND RECOMMENDATION</b>		<b>121</b>
6.1	INTRODUCTION	121
6.2	ACHIEVEMENT OF THE STUDY OBJECTIVE	121
6.2.1	Data Analysis	122
6.3	LIMITATIONS OF THE STUDY	125
6.3.1	General	125
6.3.2	Data Analysis	125
6.3.3	Sample	126
6.3.4	The Life-Style Questionnaire's Scales	126
6.4	RECOMMENDATIONS FOR FUTURE RESEARCH	127
6.5	CLOSING REMARKS	127
<b>LIST OF REFERENCES</b>		<b>129</b>
<b>APPENDIX A: The Life-Style Questionnaire</b>		<b>135</b>

## LIST OF TABLES

Table 4.1:	Distinguishing characteristics of quantitative and qualitative approaches	53
Table 5.1:	Language Distribution of the Sample.	85
Table 5.2:	Ethnic Distribution of the Sample	85
Table 5.3:	Age Distribution of the Sample	86
Table 5.4:	KMO and Barlett's Test	88
Table 5.5:	Principal Components Analysis	89
Table 5.6:	Pattern Matrix	92
Table 5.7:	Structure Matrix	93
Table 5.8:	Component Correlation Matrix	95
Table 5.9:	Cronbach's Alpha	102
Table 5.10:	Cronbach's Alpha – Factor 1	102
Table 5.11:	Item Statistics – Factor 1	103
Table 5.12:	Item-total Statistics – Factor 1	103
Table 5.13:	Cronbach's Alpha – Factor 2	105
Table 5.14:	Item Statistics – Factor 2	105
Table 5.15:	Item-total Statistics – Factor 2	106
Table 5.16:	Cronbach's Alpha – Factor 3	107
Table 5.17:	Item Statistics – Factor 3	107
Table 5.18:	Item-total Statistics – Factor 3	108
Table 5.19:	Cronbach's Alpha – Factor 4	109
Table 5.20:	Item Statistics – Factor 4	109
Table 5.21:	Item-total Statistics – Factor 4	110
Table 5.22:	Cronbach's Alpha – Factor 5	111
Table 5.23:	Item Statistics – Factor 5	111
Table 5.24:	Item Statistics – Factor 5	112
Table 5.25:	Chi-square Results	114
Table 5.26:	Maximum Likelihood Estimation	115
Table 5.27:	RMSEA Values	116
Table 5.28:	Standardised Estimated Parameters	117

## LIST OF FIGURES

Figure 3.1:	Depiction of the five general steps in establishing construct validity	43
Figure 3.2:	Construct Validity	44
Figure 4.1:	The components of reliability	68
Figure 4.2:	Confirmatory Factor Analysis (CFA)	77
Figure 5.1:	Scree Plot	91
Figure 5.2:	Standardised estimated parameters of the Life-Style Questionnaire	118

## CHAPTER 1: INTRODUCTION AND BACKGROUND

### 1.1 INTRODUCTION

The purpose of this study was to determine the construct validity of the Life-Style Questionnaire in the South African context. The Life-Style Questionnaire is an existing questionnaire which was used to collect the data for the study.

This chapter discusses firstly the background with regard to the study; secondly the research problem; thirdly the purpose of the study; and lastly the significance of the study. The chapter then concludes with an outline of the remainder of the manuscript and a brief summary.

### 1.2 BACKGROUND TO THE STUDY

Although it is the basic tendency of all human beings to compensate for feelings of inferiority and to strive for superiority, each person establishes his or her own goals in life and uses his or her own methods to reach them. Adler calls this the individual's lifestyle (Meyer, Moore & Viljoen, 2003:189). The methods used to attain established goals in life can be seen as encompassing different behaviours, which, in turn, is directed by an individual's personality. An individual's personality consists of different personality traits which is unique to each individual. Measurement and classification are indispensable in establishing which traits and what type of personality an individual possesses. Establishing what lifestyle an individual prefers to follow and being classified into a certain category can contribute to the achievement of, and self-fulfilment in a meaningful life.

“The Life-Style Questionnaire was developed as an objective means to measure into which of five trait-descriptive lifestyle categories (*aggressive, conforming, defensive, individualistic, or resistive*) participants belong” (Driscoll & Eckstein, 2007:1).

### 1.3 RESEARCH PROBLEM

Even though the Life-Style Questionnaire is not a very distinguished questionnaire in the South African context, it is, however, a classified and useable questionnaire to determine into which of the five trait-descriptive lifestyle categories an individual belongs. The need therefore existed to determine whether or not the Life-Style Questionnaire actually measures what it is supposed to measure, in other words to determine its construct validity.

Generally, validity means that a measurement taken represents what one thinks it should. This is essential to establish, because many times it is thought that one is measuring one thing, while one is actually measuring something entirely different (Children's Mercy Hospitals & Clinics, 2006:np). According to Saunders, Lewis and Thornhill (2007:594), “construct validity refers to the extent to which your measurement questions actually measure the presence of those constructs you intended them to measure”.

Construct validity in measurement is used widely over a variety of disciplines and with different views and opinions thereof. Past research indicates that, regardless of how construct validity is defined, there is not a single best way to study it. Generally, construct validity should be proved and demonstrated from a variety of perspectives. Consequently, the more strategies used to prove and demonstrate the validity of a test, the better, but the evidence provided by those strategies should be convincing (Brown, 2000:8-12).

Previous research further indicates that construct validity has always been the most problematic type of validity because it involves theory and the relationship of data to theory (Embertson, 2007:449-455). There is, however, evidence that the concept of construct validity is a very well-accepted concept (Brown, 2000:8-12). “In more recent studies, construct validity has also included whether the scores serve a useful purpose and have positive consequences when they are used in practice” (Humbley & Zumbo, 1996, in Creswell, 2009:149). Consequently, there is a need to better understand the

concept of construct validity, including the problems and purposefulness thereof.

Furthermore, many questionnaires, which have not been sufficiently researched, are being used in South Africa and this study therefore aims to contribute to future research with regard to the construct validity of a questionnaire.

“In terms of the Health Professions Act No. 56 of 1974, the Professional Board for Psychology of the Health Professions Council of South Africa (HPCSA) is mandated to protect the public and to guide the profession of psychology” (Foxcroft & Roodt, 2005:20). The Professional Board has become more and more concerned about the misuse of assessment measures in South Africa and they do recognise the important role of psychological assessment in the professional practice of psychology, as well as for research purposes (Foxcroft & Roodt, 2005:20). “Whereas the Professional Board for Psychology had previously given the Test Commission of the Republic of South Africa (TCRSA) the authority to classify psychological tests and oversee the training and examination of certain categories of assessment practitioners, these powers were revoked by the Board in 1996” (Foxcroft & Roodt, 2005:20). The reason for this was that the TCRSA did not have any constitutional control and, being a Section 21 company that operated largely in Gauteng, its membership base was not representative of psychologists throughout the country. “Instead, the Professional Board for Psychology formed the Psychometrics Committee, which, as a formal committee of the Board, has provided the Board with a more direct way of controlling and regulating psychological test use in South Africa” (Foxcroft & Roodt, 2005:20).

From the above, it appears that the misuse of psychometric assessments do indeed take place and, even though a great deal of effort has been put in place to ensure that assessments are used appropriately, there is still a need

to explore each and every classified assessment instrument in order to determine whether or not it serves the purpose it was intended to serve.

While previous research has been conducted on the construct validity (e.g. Green, 1955; Brown, 2000:8-12; Embertson, 2007:449-455) of the Life-Style Questionnaire (Praveen, Samuvel & Naachimuthu, 2007:18-21), little is still known about the construct validity of this specific Questionnaire. From an extensive search on various leading electronic databases, including Google Scholar and EBSCOHost, it appears that minimal academic research has been conducted to determine the construct validity of the Life-Style Questionnaire in the South African context. A need therefore existed to conduct further research on this specific topic.

#### **1.4 PURPOSE AND SIGNIFICANCE OF THE STUDY**

The purpose of the current study was to determine the construct validity of the Life-Style Questionnaire, developed by Driscoll and Eckstein, in the South African context. In other words, to determine whether or not the questions posed in the Life-Style Questionnaire actually measure the presence of the constructs that they are intended to measure. The outcome of the study should contribute to further exploration in order to expand the level of knowledge and understanding of this specific topic. The study of construct validity is particularly relevant in the twenty-first century, as more and more entities in South Africa are using psychometric instruments – instruments which have to be valid and reliable in accordance with the requirements of the HPCSA.

It should be clear, from the discussion on the research problem that all psychometric instruments must comply with the requirements of the HPCSA. Even though validity and reliability, together with their accompanying aspects, are the two main considerations of a psychometric instrument, the construct validity of an instrument is one of the most important aspects to consider. This

study's focus will therefore, for the most part, be on the construct validity of the Life-Style Questionnaire.

Much criticism of the profession of psychology surfaced in terms of the significance of psychological assessment, but from a psychological point of view, there is still a lot of optimism. Despite the negative criticism that has rightfully been directed at psychological assessment in South Africa, academics, clinicians and assessment practitioners in industry are still optimistic about the valuable contribution that psychological assessment can make in our rapidly-transforming society. For example, in an article that was published in the Sunday Times on 24 May 1998, Kasthuri Nainaar, the chairman of the Society for Industrial Psychology at the time, was quoted as follows: "When used appropriately, psychometrics can offer an objective, fair and productive method of assessment in organisations" (Foxcroft & Roodt, 2005:244).

Psychometrists and Industrial Psychologists, together with the HPCSA, have the responsibility to ensure that psychometric instruments meet the necessary requirements and to use them in an appropriate and ethical manner. As mentioned above, the Life-Style Questionnaire is a classified and useable questionnaire in South Africa. This study is therefore aimed at determining whether or not the construct validity of this Questionnaire does in fact meet the necessary requirements; and whether or not it can contribute to the fields of Psychometrics and Industrial Psychology.

As mentioned in the research problem, the Professional Board has become increasingly concerned about the misuse of assessment measures in South Africa, but they do, however, recognise the important role of psychological assessment in the professional practice of psychology, as well as for research purposes. If Psychometrists and Industrial Psychologists make an effort to conduct research on all psychological instruments, and the Professional Board bring their side, the problem of misuse of assessment measures could be minimised or even eliminated. This study's aim was to take an instrument



and measure its construct validity which, by itself, should indicate whether the instrument can rightfully be applied in the South African context. This study thus has a significant contribution to make in the field of Industrial Psychology and, in turn, Psychometrics.

## 1.5 CHAPTER OUTLINE

The ensuing chapters entail the following:

*Chapter 2* provides an extensive discussion on the personality and lifestyle of an individual, including an analysis within the context of the Life-Style Questionnaire. The various trait-descriptive lifestyle categories, personality traits, and the different traits contained in the Life-Style Questionnaire (i.e. the aggressive trait, conforming trait, defensive trait, individualistic trait and resistive trait) are also discussed in detail.

*Chapter 3* consists of a discussion on validity, construct validity and reliability. Definitions of these three concepts are provided and construct validity in personality research is discussed. Furthermore, the idea and logic of construct validation are briefly discussed, followed by a discussion on the most common threats to construct validation. The chapter concludes with a discussion on reliability.

*Chapter 4* describes the basic methodologies used and discusses the basic rationale for the specific ones used for this study. It includes discussions on the research design, data gathering procedure, the sample, the measuring instrument and the procedure of statistical analysis used for this study.

*Chapter 5* gives an overview of the results that were obtained from the study. Basic descriptive statistics are also provided.

*Chapter 6* illustrates the usefulness of the study and provides a discussion on the results. Furthermore, conclusions drawn from the results are made and recommendations for future research are provided.

Chapter 6 is followed by a list of references which includes all the sources used in the various chapters of this manuscript.

## **1.6 SUMMARY AND CONCLUDING REMARKS**

An individual's lifestyle is very complex and also very difficult to categorise. Traits are an inevitable part of every individual's lifestyle. The methods used to attain established goals in life can be seen as encompassing different behaviours. Behaviours are directed by an individual's personality, which, in turn, consists of different traits. Measurement and classification are necessary to establish which traits and what type of personality an individual possesses. The establishment of the preferred lifestyle of an individual followed by a classification into a certain category can contribute to the achievement of, and self-fulfilment in a meaningful life.

"The Life-Style Questionnaire was developed as an objective means to measure into which of five trait-descriptive lifestyle categories (*aggressive, conforming, defensive, individualistic, or resistive*) participants belong" (Driscoll & Eckstein, 2007:2). It is of the utmost importance that an instrument measures what it is supposed to measure and this is where construct validity comes to the fore. Especially with personality measurement, an instrument must be valid and must measure those constructs which it is supposed to measure. Construct validity specifically determines this claim. The purpose of this study was thus to determine whether or not the questions contained in the Life-Style Questionnaire's actually measures the presence of the constructs that they are intended to measure, in other words, the construct validity.

Lastly, the aim of this study was not only to emphasise the importance of the construct validity of a questionnaire, but also to accentuate the purposefulness thereof in the field of Industrial Psychology.

## **CHAPTER 2: PERSONALITY AND LIFESTYLE OF AN INDIVIDUAL**

### **2.1 INTRODUCTION**

This chapter explores the personality and lifestyle of an individual. An individual's lifestyle is directed by his or her personality and it is therefore necessary to first explore the theory from which an individual's lifestyle is derived. The lifestyle of an individual is a very broad concept and entails various aspects, definitions and categories. The Life-Style Questionnaire used in this study was developed and based on Alfred Adler's theory.

The aim of this chapter is to provide a clear understanding of an individual's personality and lifestyle, as well as his or her lifestyle in the context of the Life-Style Questionnaire. The Life-Style theory of Alfred Adler is dealt with in the first section, followed by a discussion on the lifestyle of an individual in the second section and trait-descriptive lifestyle categories, with an emphasis on the concept 'traits', in the third section. The different traits entailed in the Life-Style Questionnaire are subsequently discussed in detail. These traits include the aggressive, conforming, defensive, individualistic and resistive traits. The chapter concludes with a brief summary.

### **2.2 ALFRED ADLER'S LIFE-STYLE THEORY**

The ability to understand, as well as to predict human behaviour is one of the major goals of psychology. A significant contribution to the achievement of this goal was Adler's (1930) integrated concept of personal "life style" (Eckstein & Driscoll, 1998:np). Adler held the believe that understanding the human personality entails recognising that each individual's behaviour has societal meaning; is cohesive and contains definite patterns; is based on subjective perception; is purposeful and goal-directed; and is encouraged by a need to overcome feelings of inadequacy, together with an urge to succeed

(Dinkmeyer, Pew & Dinkmeyer, 1979, in Eckstein & Driscoll, 1998:np). To sum up, Adler saw life as an uphill struggle from birth onwards, with many skills to learn and many obstacles to overcome (DiCaprio, 1974:252). In the course of his or her effort, the individual often experiences insecurities because of his or her inability to adapt to or cope with a situation. He or she disburses much effort in bringing about security, and for the sake of preserving it, he or she also seeks a measure of reserve. This striving for security and “security plus” may lead to a one-sided development. “The power-driven individual not only saves for a rainy day, but also accumulates wealth in order to exert control over others” (DiCaprio, 1974:252).

In studying the total personality, Adler continued from the viewpoint that every human being strives towards a goal. In his book, *Menschenkenntnis*, he has said the following: “What we can perceive of mental movements is itself a movement again which is directed toward a goal” (Orgler, 1939:31). This is why we must affirm that it would be a mistake to envision the human mind as if it were a static whole; we can only visualise it as if forces were moving from it which come from a unified source and are directed toward a unified goal. Goal-seeking is already enclosed in the idea of adaptation. One cannot picture a mental and emotional life without a goal toward which moves the movement, the dynamic contained in mental life. Therefore, human life is determined by a goal. “No human being can think, feel, will or even dream without having all these mental activities determined, conditioned, limited and directed by his goal” (Orgler, 1939:31).

The lifestyle of an individual influences all manifestations, which is why one will always hear the same life melody in an individual. “Variations may, of course, occur or there may be a change of key from major to minor, but the expert will always recognise the fundamental motif” (Orgler, 1939:35). The lifestyle of a human being is an inseparable unity just as this melody is a harmonious unity. It is often said that people live a double life, but Individual Psychology rejects this belief (Orgler, 1939:35). It claims that we only really

understand an individual when we have revealed the unitary lifestyle behind this perceived duplicity.

Although it is the basic tendency of all human beings to compensate for feelings of inferiority and to strive for superiority, each person establishes his or her own goals in life and uses his or her own methods to reach them. Adler calls this the individual's lifestyle (Meyer, Moore & Viljoen, 2003:189).

### **2.2.1 Striving for Superiority and Perfection**

“Adler held that man's prolonged state of inferiority exerts a profound effect upon his whole motivational system” (DiCaprio, 1974:252). The child, just as the adult, is always striving to improve his or her status. As mentioned above, all human beings strive for superiority. In the majority of psychological phenomena, the striving for superiority of individuals is evident. “It runs parallel to physical growth and is an intrinsic necessity of life itself” (Orgler, 1939:103). Furthermore, striving for superiority lies at the root of all solutions of life's problems and is manifested in the way in which we convene these problems. It is every human being's wish to overcome difficulties in life. We all endeavour to reach a goal and by achieving it we would feel strong, superior and complete. John Dewey refers to this propensity as the striving for security (Orgler, 1939:104). Others call it the striving for self-preservation. “But whatever name we give it, we shall always find in human beings this great line of activity – this struggle to rise from an inferior to a superior position, from defeat to victory, from below to above” (Orgler, 1939:104). The striving for perfection is intrinsic in the sense that it is a part of life, a striving, an urge, a something without which life would be unthinkable.

“The urge for superiority takes many forms: insatiable craving to rule others in the power-driven psychopath, tyrannical wailing in the hypochondriac who controls everyone around her, energetic striving in the parent who wants to bring up his family to be contributing members of society” (DiCaprio, 1974:252). In thousands of ways, the human seeks to perfect his life. The

person who has attained a high degree of superiority, in the sense of perfecting the self, can be considered individualised, mature, fully functioning, or self-actualised. Adler (1939), believed that “perfecting oneself within the framework of a highly developed sense of social feeling is the healthiest expression of striving for superiority” (DiCaprio, 1974:253).

## **2.2.2 Inferiority Feeling**

In terms of genetic considerations, it is said that to be human means to feel inferior. To put this in the wrong, certain people have figured that in order to arrive at a feeling of inferiority a child must originally have had a sense of high personal value (Orgler, 1939:115). Considering that every child is in essence inferior in the face of life and cannot exist without a substantial measure of social interest by those close to him or her and if one considers the smallness and helplessness of a child which persists for an extensive period of time and which brings about the perception that we are barely equal to life, then one can assume that at the beginning of every psychological life there is a relatively deep inferiority feeling. (Orgler, 1939:115).

In the struggle for perfection, man is always in a state of confrontation and feels unsettled before the goal of perfection. It is only when he feels that he has reached a satisfying stage in his upward struggle that he has the feeling of rest, value and happiness (Orgler, 1939:116). The inferiority feeling govern the psychological life and can easily be understood from the feeling of imperfection and incompleteness and from the continuous striving of man and mankind.

Because it is assumed that the feeling of inferiority is a sign of weakness and something to be ashamed of, there is naturally a strong propensity to conceal it.

“Indeed, the effort of concealment may be so great that the person himself ceases to be aware of his inferiority as such, being wholly preoccupied with

the consequences of the feeling and with all the objective details that subserve its concealment” (Orgler, 1939:119).

Lastly, the feeling of one’s own inferiority and unfitness, the sense of weakness, of being little, of insecurity, through its inherent feelings of discontent and dissatisfaction, becomes a suitable basis for goal striving in that it permits the inner impulses to come closer to a imagined final goal (Orgler, 1939:123).

### **2.2.3 Goal of Life**

Adler spoke repeatedly of the “goal of life”, as if a person has only one goal – a concept that may be very confusing (DiCaprio, 1974:260). A person has many everyday desires which encourage him or her to work towards goals. Yet, in each person there is usually one outstanding goal, conscious or unconscious, which plays a dominant role in that person’s life. Sometimes the guiding goal is a secret ambition that is cherished and protected from being discovered by others. “Adler maintained that the neurotic individual usually harbours a secret ambition of being unique and extraordinary among men” (DiCaprio, 1974:260). He may thus act as if the secret ambition is being fulfilled. “The point is that the concrete goals of life stem from a feeling of inferiority and can best be comprehended as expressions of the one ultimate goal of striving for superiority” (Adler, 1927 in DiCaprio, 1974:260). Thus, goals must be interpreted through the knowledge of a person’s style of life.

### **2.2.4 Lifestyle Theory**

“A lifestyle investigation involves regression to formative childhood influences for the purpose of determining existential decisions regarding life, self, and others that affect present behaviour and may affect future behaviour” (Eckstein & Driscoll, 1998:np). Thus, even though the time reference is the past, determination of implications for the present and future is the goal of a lifestyle assessment. An exploration of this type focuses on concerns such as



birth order, interpersonal relationships between family members, family values, and the individual's early memories of influential experiences. "Adlerian theory, which represents a departure from orthodox, 'stimulus response', environmental behaviourism, is based on the assumption that one's phenomenological personal decisions and conclusions ("private logic") are the crucial determinants of behaviour" (Ansbacher & Ansbacher, 1958, in Eckstein & Driscoll, 1998).

As Ansbacher (1967) noted, the concept of "lifestyle" is much more humanistic than that of a predetermined "life plan". It is possible to develop an understanding of an individual as a self-consistent and independent human being by exploring and assessing his or her lifestyle. An individual's fundamental goal is reflected in all his or her personal actions as forward oriented, focused, and is determined by values rather than by straightforward physiological responses to the environment (Eckstein & Driscoll, 1998:np).

Similar to any data derived from self-disclosure, information concerning an individuals' lifestyle is subject to a certain amount of bias. Gushurst (1977) speculated that interpersonal sharing is influenced by the following factors (Eckstein & Driscoll, 1998:np):

- *"The degree to which a person actually knows himself or herself.* To be able to identify patterns established early in life and to provide psychologically relevant data, an individual must possess a degree of self-awareness. The person who has not developed introspective abilities is at a disadvantage in this respect.
- *The information that a person chooses to share.* Often an individual consciously decides to omit, emphasize, or distort data in a manner consistent with his or her life style. Avoidance behaviour, for example, affects the degree of conscious distortion of data – it is used either to escape embarrassment, manipulation, or harm to protect one's own civil liberties or those of significant others (by failing to discuss such issues

as alcoholism or child abuse). “Gaming” also results in distortion of data and is characterised by attempts to seduce, discourage, or praise the person recording the data.

- *A person’s desire to avoid pain and hurt whenever possible.* This factor has less impact when an individual perceives the person recording the data as helpful, thereby minimising the fear of being hurt.”

Adler (1929), used the expression “style of life” to designate the unique configuration of characteristics identifying an individual (DiCaprio, 1974:260). Each style of life is unique, though the psychology of personality has not yet advanced to a point which permits adequate characterisation of the unique individual. One cannot, so to speak, put a person on paper. While insisting on the uniqueness and complexity of lifestyles, Adler, in his description of them, usually used general trait names, such as the power-driven individual, the optimist, the pessimist, or the seclusive orientation. “He did, however, elaborate some traits which are less general but expressive of a dominant trait” (DiCaprio, 1974:260).

One’s lifestyle is integrated, with all the components working together (Adler, 1931 in DiCaprio, 1974:260). Every single major component has an effect on all the others. If a person is, for example, intelligent, a large portion of his behaviour is influenced by this fact. In most things he does, his intelligence will play a major role, although some behaviours are more affected by it than others. Some components are more influential, more easily aroused and more central than others. “In characterising the style of life one can usually point to a single directional tendency which is the most central determinant” (DiCaprio, 1974:261).

## 2.3 THE LIFESTYLE OF AN INDIVIDUAL

### 2.3.1 Defining Lifestyle

“Individual lifestyles bear directly on the length and quality of life” (Berardo, La Greca & Berardo, 1985:5). As mentioned hereinbefore, although it is the basic tendency of all human beings to compensate for feelings of inferiority and to strive for superiority, each person establishes his or her own specific goals in life and uses his or her own methods to reach them. Adler calls this the individual’s lifestyle (Meyer, Moore & Viljoen, 2003:189). Stated differently, Meyer, Moore and Viljoen (2003:115), define lifestyle as: “the way in which a person strives for superiority in choosing his or her own goals and establishing his or her own methods to attain them”.

Most dictionaries did not define the term “lifestyle” until after the 1970s. The *Morrow Book of New Words* (Mager & Mager, 1982:149) list two definitions for lifestyle: (1) “a psychological method of achieving a feeling of adequacy and status used during growth as conceived by Austrian psychiatrist Alfred Adler (1870 – 1937)”; and (2) “the way in which an individual lives, e.g., dress, habits, friendships, values, etc.”

Praveen, Samuvel and Naachimuthu (2007,np), define “lifestyle” as “the characteristic reactions of an individual to life or life situations.” According to Adler, an individual’s characteristic reactions to life are formed before the age of five (Myles, 2001:np). Shulman (1973:98) believed that once that framework had been established, new incidences will be construed within that framework (Myles, 2001:np). The “lifestyle” set early in one’s life have the propensity to persist and to influence later preferences, values and beliefs throughout an individual’s life.

“Although Adler maintains that people all develop their own, unique styles, he distinguishes between four characteristic types of lifestyle, namely the *active-constructive*, the *passive-constructive*, the *active-*

*destructive* and the *passive-destructive* lifestyles” (Dreikurs, 1962; Maddi, 1989 in Meyer, Moore & Viljoen, 2003:134).

- **The active-constructive type:** This type of lifestyle typically develops in a family environment where the main element is one of collaboration, trust and respect. It is noticeable by optimism and a positive, caring, community-oriented approach to problem-solving. Individuals with this type of lifestyle are inclined to set goals which serve the community, and are therefore often motivated and active in their striving to be successful and in achieving their goals. For that reason, they are often community leaders.
- **The passive-constructive type:** Individuals with this type of lifestyle also tend to adopt community-oriented goals, but they prefer to follow their goals in a submissive way by relying on others to take the initiative. These individuals are consequently prone to be friendly and charismatic, but to some extent lack self-determination and enterprise.
- **The active-destructive type:** Individuals with this type of lifestyle are inclined to have goals which are egotistical and which could disadvantage society. They work intensely to fulfil their goals and are frequently power-seeking individuals who may even reveal antisocial behaviour.
- **The passive-destructive type:** People with this type of lifestyle are prone to be antisocial and tend to be lazy and submissively aggressive. Such individuals have a propensity towards selfish or antisocial goals, but in a somewhat passive way (Meyer, Moore & Viljoen, 2003:134).

### 2.3.2 Lifestyle in the Context of the Life-Style Questionnaire

In the previous section, the meaning of “lifestyle” was discussed. In this section, the focus will be placed on the meaning of “lifestyle” specifically within

the context of the Life-Style Questionnaire. “The Life-Style Questionnaire was developed as an objective means to measure into which of five trait-descriptive lifestyle categories (*aggressive, conforming, defensive, individualistic or resistive*) participants belong” (Driscoll & Eckstein, 2007:2).

From the discussion on the four characteristic types of lifestyles distinguished by Adler, an association can be made with the five lifestyle categories in the Life-Style Questionnaire. Firstly, the active-constructive lifestyle can be associated with the aggressive trait in the Life-Style Questionnaire. Both these lifestyles are characterised by individuals who are ambitious, active in their striving towards successful achievement of their goals, and can be seen as potential leaders. Secondly, the passive-constructive lifestyle can be associated with the conforming trait in the Life-Style Questionnaire. These two categories are characterised by individuals who are dependable, warm, charming and friendly, but they somewhat lack in independence and enterprise. Thirdly, the active-destructive lifestyle of Adler can be associated with both the defensive and individualistic traits in the Life-Style Questionnaire. These two categories are characterised by individuals who are frequently “loners”; their goals are selfish; they are not concerned with public opinion; and may exhibit antisocial behaviour. Lastly, the passive-destructive lifestyle of Adler can be associated with the resistive trait in the Life-Style Questionnaire. Both categories are characterised by individuals who prefer to “swim against the current” rather than support “establishment” values, and they also have selfish or antisocial goals.

None of the lifestyle category types is “good” or “bad” or “right” or “wrong”, because every individual's lifestyle is unique. “Each individual is capable of using all the styles, but an individual is generally just more comfortable using one or more of the traits. How an individual with the specific traits of each type reacts to his or her environment is unique, and each style of life includes facets of the others – resulting in an infinite variety of personality traits” (Myles, 2001:np). The Life-Style Questionnaire tries to provide an insight into an individual's outlook, and the results can be used to help the participant

identify personal strengths and weaknesses and make choices among alternative behaviours. The results should not be seen as labelling past behaviour, but rather as encouragement for participants' future behaviour.

“To avoid possible negative stereotyping, the five lifestyle categories were given animal labels: tiger, chameleon, turtle, eagle and salmon” (Driscoll & Eckstein, 2007:3). The five trait-descriptive lifestyle categories are briefly discussed with reference to the animal labels (Driscoll & Eckstein, 2007:np).

- **Tigers:** Tigers are usually deemed as being aggressive. They take pleasure in being authoritative; they enjoy being the centre of attention; and they may even insist on having things their way. Tigers generally were childhood leaders and maintain this role throughout adulthood. They are furthermore enterprising, enthusiastic and very motivated.
- **Chameleons:** Chameleons are usually considered to be *conforming*. They are lithe and inclined to face problems directly. Chameleons often progress fast in a business environment as they are reliable, hard-working and sincere. In addition, they are cooperative, outgoing, warm, considerate and practical and may be artistic.
- **Turtles:** Turtles are usually regarded as being defensive. These individuals are sincere and imaginative and lead peaceful, steady lives. Turtles are often reclusive with only one or two close relationships. They are perceptive and sensitive with some trouble admitting their weaknesses. Turtles may be considered as being stubborn because they do not have any interest in changing the status quo.
- **Eagles:** Eagles are inclined to be regarded as *individualistic*. They are not disturbed by others' opinions and may be selfish and violate the rights of others to succeed in their objective of having things their own way. Eagles are competent, hard-working, confident, and adventurous –

idealising growth. They are furthermore often found in an environment that values independence and are often capitalists.

- **Salmon:** Salmon are characterised by a resistive trait. They favour to “swim against the current” as opposed to supporting “establishment” values. These individuals may take up causes against coercion and insist on being heard. They are enthusiastic, progressive and disobedient and they have an aversion to false social niceties.

## 2.4 TRAIT-DESCRIPTIVE LIFESTYLE CATEGORIES

In the previous section, the different trait-descriptive lifestyle categories were briefly discussed. In this section, the main constructs will be discussed in more detail, namely traits, the aggressive trait, the conforming trait, the defensive trait, the individualistic trait and the resistive trait.

### 2.4.1 Traits

Before proceeding with a discussion on the different trait-descriptive lifestyle categories entailed in the Life-Style Questionnaire, it is important to first define and discuss in detail what a trait is, as the Life-Style Questionnaire is based on traits.

“In general, traits denote the characteristic and consistent ways in which people respond across time and in various situations” (Pervin & John, 1997 in Bergh & Theron, 2003:338). Furthermore, traits are psychophysical systems that truly exist; that give structure to personality; and direct and motivate behaviour. Traits, as a result of underlying neurological processes, provide stability to behaviour and personality (Bergh & Theron, 2003:338).

It should be clear from the above that traits are the underlying processes of an individual’s personality. To further demonstrate this, Bergh and Theron (2003:336), state that “[t]rait concepts are used to describe personality

structure, motivation, personality development and psychological adjustment in terms of specific and combined elements, characteristics or attributes of personality.”

Traits can also be viewed as elements varying in quantities and qualities amongst individuals. These elements can be measured to differentiate and compare people and to predict a person’s behaviour across time and in different situations.

Two key assumptions can be made from general conceptions of personality traits. “Firstly, it is assumed that traits are stable over time. Most people would accept that an individual’s behaviour naturally varies somewhat from occasion to occasion, but would maintain also that there is a core of consistency which defines the individual’s ‘true nature’: the unchangeable spots of a leopard” (Matthews, Deary & Whiteman, 2003:3). Stated differently, there are differences between individuals that are apparent across a variety of situations. Stability distinguishes traits from more temporary properties of the person, such as temporary mood states (Matthews, Deary & Whiteman, 2003:3).

It should be added that traits are tendencies or predispositions that people are expected to act according to and it is quite consistent and enduring, but these traits may change to a certain extent over time and in certain circumstances or situations.

The second assumption made from general conceptions of personality traits is that it is generally believed that traits directly influence behaviour. People who have similar traits may also reveal similar behaviour (Bergh & Theron, 2003:337). According to trait approaches, people may be similar in some respects, but every individual also has a unique disposition, because traits may manifest differently in different people as a result of different genetic, learning and situational experiences. “Cattell, for one, recognizes that certain



traits have genetic origin, but environmental factors also influence the formation and expression of personality” (Bergh & Theron, 2003:338).

McCrae et al. (2000) state: “Traits cannot be directly observed, but rather must be inferred from patterns of behaviour and experiences that are known to be valid trait indicators” (Matthews, Deary & Whiteman, 2003:6). Confusion could arise as to whether an individual is born with certain traits which stay consistent over his or her lifespan or whether an individual’s traits could change during his or her lifespan.

From the above statement, traits can be seen as being inferred from patterns of behaviour and experiences, but the question then arises: are traits influenced by behaviour and experiences or are behaviour and experiences influenced by an individual’s traits? A clear answer to this question is very difficult to provide, as traits, personality, behaviour and experiences are all interrelated. It is important to bear in mind that every individual’s personality differs and therefore will reveal different behaviours from situation to situation.

Traits are inherited and represent learned potential or predisposition, which direct and motivate our behaviour and which give structure to an individual’s personality. “A combination of traits can lead to a profile or a type or style description” (Bergh & Theron, 2003:339).

The Life-Style Questionnaire is one of many tools which measures different traits to categorise a person in a certain type or style, in this case, a person’s lifestyle is profiled. Traits can thus be used to indicate possible foundations or causes of behaviour; descriptions of characteristic and consistent behaviour; and methods to explain the composition of a personality (Bergh & Theron, 2003:339). “Trait approaches such as those developed by Allport, Cattell and Eysenck emphasize the importance of both biological and environmental factors in the development of those traits which are the building blocks for all aspects of personality and human behaviour” (Bergh & Theron, 2003:347).

Trait approaches to personality may well be the most understandable exponents of personality description, with the emphasis on individual differences (Bergh & Theron, 2003:337). Traits do not only describe an individual's personality, but also aspects related to personality. "Traits may be measured in terms of abilities, motives, interests, values, emotions, attitudes and interpersonal behaviours" (Bergh & Theron, 2003:337). Personality traits play a very important role in the way in which an individual lives.

Traits can be seen from two different viewpoints, namely from an everyday viewpoint and a scientific viewpoint. There is a huge gap between the everyday concept of a trait and the concept that is scientifically useful (Matthews, Deary & Whiteman, 2003:4). When approaching traits from a scientific viewpoint for developing a science of traits, several distinct steps are required.

The first step will be to measure and classify traits. The simplest technique for personality measurement is to ask the person involved to rate how well trait adjectives pertain to him- or herself (Matthews, Deary & Whiteman, 2003:4). There is a wide variety of words which can be used to define an individual's personality. "Many of these words have rather similar meanings: precise, careful, meticulous and painstaking would all seem to relate to some common quality of conscientiousness" (Matthews, Deary & Whiteman, 2003:5). Traits with common characteristics, such as the example above, can jointly be grouped as an element or a facet of personality. The question can now be asked: what is the number of elements or facets required to define an individual's personality? "Much research effort has been devoted to drawing up classificatory schemes of fundamental personality dimensions: estimates of the number required range from three to thirty or so" (Matthews, Deary & Whiteman, 2003:5).

The second step in personality research is to test whether or not traits relate to behaviours and, if so, how they relate (Matthews, Deary & Whiteman, 2003:5). As mentioned above, traits direct and motivate an individual's

behaviour. An important aspect to consider is the consistency of behaviour in different circumstances. The implied theory of the trait approach is that people do indeed behave consistently in different situations, a theory which has been challenged (Matthews, Deary & Whiteman, 2003:5).

Because of the different points of view and assumptions regarding traits, the question arises as to whether a precise theory of traits can at all be developed. "The idiographic approach to personality (e.g., Lamiell, 1981) considers that all aspects of personality are fundamentally unique and idiosyncratic to each individual, so that no generalised theoretical statements are possible" (Matthews, Deary & Whiteman, 2003:6). When considering the population on earth and acknowledging that every individual differs, it should be clear that no generalised theoretical statements regarding personality and traits are possible.

Modern views of traits are closely related to the processes of measurement and assessment which is necessary to identify basic personality dimensions (Matthews, Deary & Whiteman, 2003:12). Through measurement and assessment, one can relate certain dimensions or traits to a personality type, which can be viewed as a cluster of different behaviours extinct to an individual. In general, the trait researcher has some hypothesis about the number and nature of the principle dimensions, and designs a questionnaire accordingly to measure them (Matthews, Deary & Whiteman, 2003:12). However cautiously the questionnaire has been designed, it is still necessary to assess its satisfactoriness formally, by application of psychometrics, the science of psychological measurement, in order to evaluate how useful a measuring device the questionnaire actually is. If the questionnaire turns out to be unsatisfactorily, or not measuring what it is intended to measure, it can be modified and items can be added or detracted.

Any single trait scale must be satisfactory with respect to three essential criteria: reliability, stability and validity. Stability falls outside the scope of this paper and therefore will not be discussed. Reliability will be discussed only

briefly. The main focus, however, will be on validity which will be discussed in more detail. Ultimately, the objective of theory-driven trait research is to establish construct validity. “The essence of construct validity is that correlations between the trait and external criteria are predicted in advance from an adequate scientific theory, rather than from common sense or a superficial analysis of trait characteristics” (Matthews, Deary & Whiteman, 2003:14). Construct validity arises out of the total web of empirical data and theoretical analysis which builds up around a trait (Eysenck, 1981 in Matthews, Deary & Whiteman, 2003:14). Construct validity will be discussed in detail in Chapter 3.

#### **2.4.2 The aggressive trait**

The term “aggression” will first be defined before ensuing on a discussion of the aggressive trait as such. The theoretical differences in the literature are apparent when comparing the following definitions of aggression (Hogg & Vaughan, 1995 in Bergh & Theron, 2003:218):

- “behaviour that results in personal injury or destruction
- behaviour intended to harm another of the same species
- behaviour directed towards the goal of harming or injuring another living being who is motivated to avoid such treatment
- the intentional infliction of some type of harm on others.”

It should be clear that, from a theoretical perspective, it is difficult to give a clear and exact definition of aggression.

Trait aggressiveness is distinguishable from “aggression”, also known as “aggressive behaviour”. Care should be taken not to confuse these concepts. From the above definition of aggression, it can be concluded that aggression (or aggressive behaviour) can be described as “any behaviour intended to harm another individual who is motivated to avoid being harmed” (e.g., Baron & Richardson, 1994; Coie & Dodge, 2000; and Green 1990, 1998a, 1998b in Bettencourt, Talley, Benjamin & Valentine, 2006:752).

Meyer, Moore and Viljoen (2003:148) define “aggression” as: “... a particular way of behaving which an individual adopts in order to accomplish certain life tasks, and which is not fully rational.”

A distinction can also be made between different types of aggression. A brief discussion of the most common types of aggression follows:

- *Human aggression.* According to Anderson and Bushman (2002:28), human aggression is any action directed towards another human being that is carried out with the intention to cause harm. In addition, the perpetrator must believe that the action will harm the individual, and that the individual is motivated to avoid the deed (Bushman & Anderson, 2001; Baron & Richardson, 1994; Berkowitz, 1993; and Green, 2001, in Anderson & Bushman, 2002:28). It must be pointed out that accidental harm is not aggressive because it is not planned or intended. Moreover, harm that is an incidental consequence of helpful actions is also not aggressive, because the perpetrator believes that the target is not motivated to avoid the action.
- *Interpersonal aggression.* The dimensions of this problem, in terms of cost to life and property, are astounding (Huesmann, Eron, Lefkowitz & Walder, 1984:1120, in Anderson & Bushman, 2002:29). Extensive research into the root causes of aggression have yielded various models claiming to describe the ontogeny of different aspects of aggressive behaviour. Yet, there is hardly a sign that the responses of either the law or psychological establishments, based on these theories, have had much impact (Huesmann *et al.*, 1984:1120, in Anderson & Bushman, 2002:29).
- *Hostile aggression.* Hostile aggression has traditionally been regarded as being impulsive, unplanned, motivated by anger, having the ultimate purpose of harming the target, and occurring as a response to some

perceived frustration (Anderson & Bushman, 2002:29). It is sometimes also called emotional, spontaneous, or thoughtless aggression.

- *Instrumental aggression.* This type of aggression is considered as an intentional way of obtaining some objective other than harming the victim, and being proactive rather than reactive (Berkowitz, 1993 & Green, 2001 in Anderson & Bushman, 2002:29).

From the definitions discussed above, it is apparent that aggression forms an integral part of every individual's life and therefore has an impact on an individual's lifestyle. "Aggressive behaviour is distinguished from high levels of trait aggressiveness; the latter identifies people who are prone to hostile cognitions and angry affect as well as a readiness to engage in physical and verbal aggression" (Buss & Perry, 1992, in Bettencourt, Talley, Benjamin & Valentine, 2006:752). Furthermore, Tiedens (2001) theorises that the propensity for individuals high in trait aggressiveness, to make hostile acknowledgments, might increase anger and form a violent circle of hostility and negative affect (Bettencourt, Talley, Benjamin & Valentine, 2006:755).

Aggression as a trait of solving social problems typically surface early in life. Inherent, physiological, and other factors without a doubt play a role in many cases, but the presence of the "appropriate learning conditions" is possibly more significant in most cases (Eron, Walder, & Lefkowitz, 1971; Lefkowitz, Eron, Walder & Huesmann, 1977, in Anderson & Bushman, 2002:41). The "appropriate learning conditions" appear to be those in which the child has various opportunities to observe aggression, in which the child's own aggression is reinforced, and in which the child is the object of aggression (Huesmann *et al.*, 1984:1121, in Anderson & Bushman, 2002:41). The result is that children are inclined to become aggressive, however, only some children become seriously aggressive.

Continually exposing children to certain factors (e.g. violent behaviour, poor parental rearing, etc.) may produce aggressive adults (Huesmann & Miller,

1994, and Patterson et al., 1992, in Anderson & Bushman, 2002:42). According to these authors, such continuing effects are a result from the development and reinforcement of aggression-related knowledge structures.

Trait aggressiveness can be measured as an independent construct with a self-report assessment, such as the Buss-Perry Aggression Questionnaire. As mentioned under the discussion of the Life-Style Questionnaire, trait aggressiveness (referred to as "aggressive" in the Life-Style Questionnaire), can also be measured as an independent construct in the Life-Style Questionnaire.

Within the context of the Life-Style Questionnaire, people with an aggressive trait tend to be seen as: "Aggressive, Confident, Persistent, Persuasive, Self-Reliant, Independent, Initiators, Potential Leaders, Ambitious, Clever, Enterprising, Vigorous, Demanding, Active, Planners, Domineering, and Competitive" (Driscoll & Eckstein, 2007:4).

### **2.4.3 The conforming trait**

Again, as with the aggressive trait, it is important to first define "conformism" before discussing the conforming trait. According to Meyer, Moore and Viljoen (2003:450), conformism is "[a]n effort to evade the stress of authenticity – of living lives of personal responsibility – people fall into the stream of conformism and do what most other people do. They are afraid to be different and to take a committed stand. They feel safe by going along with the crowd." It can thus be said that the strength of desire to conform is a personality trait whereby some people will try to conform to whatever group they are in at any specific time.

Furthermore, every individual has, to a certain extent, a need for conformity. What does this need mean? As evident from the brief discussion above, the need for conformity is a desire to follow the norms of a group of people in order to be accepted as part of the group and not to be abandoned as an

outcast (<http://changingminds.org/explanations/needs/conformity .htm>). According to Changing Minds (<http://changingminds.org/explanations/needs/conformity.htm>), “we are a tribal animal, which leads us to have a deep need to belong to a group of some sort.” Conforming to group norms is a sign to the other group members that “I am like you; I am following your rules; and I am not a threat”. This sign signifies one’s consistency of behaviour, permitting other people to predict what you will do. Conforming to group norms also enhances one’s esteem within the group.

“The strength of desire to conform is a personality trait whereby some people will try to conform to whatever group they are in at that time, whilst other “non-conformists” will go in the other direction, deliberately asserting their individuality by rejecting all but a very few sets of norms” (<http://changingminds.org/explanations/needs/conformity.htm>).

The following is a very brief explanation of some of the most well-known theories about how we seek to conform to others (<http://changingminds.org/explanations/theories.htm>):

- Acquiescence Effect: this is when one rather answers positively as opposed to negatively.
- Bystander Effect: one would unlikely help if there are a lot of bystanders.
- Consistency Theory: this is when one seeks the comfort of inner alignment.
- Commitment: when one feels obligated to complete a commitment.
- Communication Accommodation Theory: this is when one desires to be like someone else.
- Epistemological Weighting Hypothesis: this is when one’s conformance is dependent on whether one’s standards closely match the group’s standards.
- Group Locomotion Hypothesis: when members of a group are inspired to achieve the goals of the group.
- Groupthink: preservation of the group’s unity becomes essential.



- Impression Management: when we are being watched, we behave well to make an impression.
- Informational Social Influence: others are copied when we are in a situation where we do not know what to do.
- Just-world phenomenon: acting good will be rewarded and acting bad is punishable
- Normative Social Influence: we are forced to conformity by basic group need.
- Pluralistic Ignorance: often people do not agree with the norms of a group but do not voice their disagreement.
- Politeness Theory: depending on whether one cares, one would behave either politely or rudely
- Reciprocity Norm: one feels obliged to reciprocate a favour.
- Roles: conformity to shared behavioural expectations.
- Self-Fulfilling Prophecy: when one acts according to the manner in which one is treated.
- Self-Monitoring Behaviour: we are affected by how others perceive us.
- Social Desirability Bias: rules by society are only followed when we are being watched.
- Social Impact Theory: our behaviour is determined by how many people are watching us.
- Social Influence: this is how strongly one is influenced by others.
- Social Learning Theory: one learns a great deal by watching others, thinking about it and then experiments.
- Social Norms: one has no option but to follow the rules of the group.
- Spiral of Silence Theory: when we are in the minority, we keep quiet, but if we are in the majority, we speak up.
- Symbolic Convergence Theory: searching communities of agreement.

To conform, in essence, means to adapt to other people and the environment. As such, they tend to “go along” with other people and do what most other people do. Within the context of the Life-Style Questionnaire, people with a

conforming trait tend to be seen as: “Cooperative, Sociable, Warm, Helpful, Diligent, Persistent, Gentle, Sincere, Honest, Conscientious, Tolerant, Practical, Deliberate, Serious, Obliging, Self-Denying, Dependable, Conforming, Socially Ascendant, and Peaceable” (Driscoll & Eckstein, 2007:4).

In general, individuals with a conforming trait are easily accepted by society. The reason for this is that these individuals tend to conform from situation to situation in order to be accepted and therefore it might seem as if the individual fits in well with the particular situation and the particular group of people.

#### **2.4.4 The defensive trait**

People with a defensive personality trait tend to be earnest and resourceful and lead self-controlled and stable lives. People who possess a strong defensive personality trait often prefer to be alone and have only one or two close relationships. They are also considered to be intuitive and sensitive and may also be seen as stubborn.

Defensive reactions which become apparent in certain circumstances, can flow from the defensive personality trait. These defensive reactions can be primarily direct or conscious or more obtrusive (Bergh & Theron, 2003:402). “With direct defence reactions the individual mostly behaves in a conscious and overtly perceptible way to adapt to conflict, frustration, anxiety and stress, such as showing aggression or withdrawing (fight or flight reactions) from a situation” (Bergh & Theron, 2003:402).

Displacement is a defence mechanism which individuals use to cope with aggression as well as certain other traits. “Displacement functions by finding a substitute for the object that society’s moral codes forbid and using the substitute object for drive satisfaction” (Meyer, Moore & Viljoen, 2003:67). Withdrawal can be observable, but in certain cases people may experience

apathy, despair and hopelessness to the extent that they stop trying or even living.

Within the context of the Life-Style Questionnaire, people with a defensive trait tend to be seen as: “Stable, Self-Controlled, Placid, Earnest, Defensive, Stubborn, Apologetic, Resourceful, Insecure, Vulnerable, Rationalistic, Intuitive, Guarded, and Persistent” (Driscoll & Eckstein, 2007:5).

#### **2.4.5 The individualistic trait**

The individualistic trait is derived from the term “individualism”. Individualism is one of the most difficult terms to describe. It is employed in so many different ways – approving and disapproving, descriptive and normative, social and psychological, economic and political – that one never knows what is really meant when the word is used.

Individualism can be viewed as the set of behavioural or personal characteristics by which an individual is recognisable. Furthermore, it is a view that emphasises the importance and meaning of each person. Individualism encompasses a value system, a theory of human nature, and a belief in certain political, economic, social and religious arrangements. For the individualist, all values are human-centred; the individual is of the utmost importance; and all individuals are equal. Individualism places immense value on autonomy, on privacy, and on mutual respect. Negatively, it embraces resistance to authority and to all approaches of control over the individual, particularly when exercised by the State. As a theory of human nature, individualism holds that the interests of the normal adult are best served by allowing him or her maximum freedom and responsibility for choosing his or her objectives and the means for obtaining them.

As mentioned hereinbefore, individuals with an individualistic trait are not concerned with public opinion and may reveal egoistic behaviour. These individuals are also likely to infringe on the rights of others just to get their own

way. Furthermore, they can be described as “capable, industrious, assertive, and adventurous and they generally strive for progression in their lives.” Lastly, these individuals can be found in any field that esteems independence and they are often entrepreneurial (Driscoll & Eckstein, 2007:5).

Individuals with an individualistic trait can be seen as people with a strong personality in the sense that they fight to get what they want in life. The assumption is made that society may see these individuals as self-absorbed with no respect and empathy for others. The question can be asked whether it is right or wrong to have an individualistic trait or personality. As mentioned under the discussion of the Life-Style Questionnaire, there is no “right or wrong” trait. People are unique in every sense of the word and therefore it is important to understand why people with an individualistic trait behave the way they do in specific situations.

Within the context of the Life-Style Questionnaire, people with an individualistic trait tend to be seen as: “Capable, Industrious, Strong, Forceful, Foresighted, Clear thinking, Independent and Intelligent” (Driscoll & Eckstein, 2007:5).

#### **2.4.6 The resistive trait**

Resistance can be thought of as behaviour that is against the “norm”. There is an infinite majority of literature available on resistance, but not in the context of the Life-Style Questionnaire.

Even though resistant behaviour and resistance regarding internal emotions are interrelated, the explanations differ, especially in terms of the Life-Style Questionnaire and everyday viewpoints. As far as internal emotions are concerned, resistance may result when an unpleasant experience is triggered and an individual does not want to re-live that experience. “Resistance becomes operative when repressed desires threaten to surface at the

conscious level, thereby increasing anxiety, for example, during therapy” (Meyer, Moore & Viljoen, 2003:63).

Individuals with a resistive trait prefer to “swim against the current” rather than support “establishment” values. These individuals may take up causes against oppression and insist that they be heard. Furthermore, they are vigorous, progressive, and rebellious and they dislike what they consider to be false social niceties. Within the context of the Life-Style Questionnaire, people with a resistive trait tend to be seen as: “Persuasive, Independent, Vigorous, Demanding, Rebellious, Protecting, Forceful, Progressive, and Competitive” (Driscoll & Eckstein, 2007:5).

## **2.5 SUMMARY**

Personality traits are manifested early in the developmental stages of all human beings and remain relatively constant throughout an individual’s lifespan. It is, however, important to take factors such as parental rearing, the environment, the community, socio-economic status and so forth into account when trying to explain why an individual behaves in a certain manner. Even though the Life-Style Questionnaire categorises individuals with certain traits into a specific category, it should be kept in mind that different traits will be revealed as situations change.

Situations provoke different reactions and therefore an individual will display different behaviour on different occasions and in different situations. An individual’s personality is one of the most complex concepts to grasp and the likelihood that every trait aspect of an individual’s personality can be fully defined and explained is almost impossible. Therefore, when looking at the results of the Life-Style Questionnaire, the abovementioned aspects should be kept in mind and care should be taken as to how the information is presented.

## **CHAPTER 3: VALIDITY, CONSTRUCT VALIDITY AND RELIABILITY**

### **3.1 INTRODUCTION**

This chapter explores the concepts “validity”, “construct validity” and “reliability”. According to Wainer and Braun (1998), “[v]alidity ... is a unitary concept (Winter, 2000), but in reality, validity cannot be viewed as such.” Validity was traditionally subdivided into three categories: content, criterion-related, and construct validity (Brown, 2000:231-249). Construct validity is one of the three main types of validity, but probably the most important and well-known type of all. “Reliability refers to the repeatability, stability or internal consistency of a questionnaire” (Jack & Clarke, 1998 in Rattray & Jones, 2005:np). A discussion on validity, construct validity and subsequently reliability follows.

The aim of this chapter is to provide a clear understanding of the abovementioned concepts. An overview of construct validity will be given, whereafter a discussion on validity and construct validity will follow. The idea and logic as well as construct validity in personality research are furthermore discussed. The subsequent section entails a brief discussion on the most common threats to construct validity. The chapter concludes with a discussion on reliability.

### **3.2 OVERVIEW OF CONSTRUCT VALIDITY**

Applying the perspective of Cronbach and Meehl (1955), psychological constructs are fundamentally unobservable (Smith, 2005:396). For example, one cannot directly observe neuroticism, introversion, extraversion, independency, or any other inferred trait. When inferring the existence of traits such as introversion or extroversion, it has the advantage of describing

individuals, their differences as well as the nature of dysfunction (Goldberg, 1995 in Smith, 2005:396).

It is essential to study the theoretical nature of traits, since they contribute to one's understanding and clarify a great deal of human behaviour. "Therefore, the first challenge for scientific psychology concerns how to measure hypothetical constructs such as these in a convincing, valid way" (Smith, 2005:396).

According to Cronbach and Meehl (1995), the measurement of hypothetical constructs is based on the demonstration that one's measure of a particular construct relates to measures of other constructs in a hypothetically and theoretically predictable way (Smith, 2005:396). "For hypothetical constructs, there is no good way to determine whether a measure reflects the construct validity, except to examine whether scores on the measure conform to a theory, of which the target construct is part" (Smith, 2005:397). In the field of psychology, one cannot have a "bureau of psychological constructs" – the inferred constructs are measured and the validity of the measure forms part of the validity of the fundamental theory. Cronbach and Meehl (1995) recognised this problem and pointed out the need for bootstrapping. When it is not possible to begin with proven theory or a particular measurement, it is necessary to conduct a series of studies in order to examine the different theoretical and measurement possibilities. A theory can never be fully proven, but during this process, frequent evidence that is consistent with the same theories increases the confidence in that theory (Smith, 2005:397).

It is important to point out that Cronbach and Meehl's (1995) emphasis is not on recording some successful predicted correlations. "Because construct validation involved basic theory testing, they emphasized principles for making inferences about the meaning of test scores or experimental outcomes" (Smith, 2005:397). Methodologists have often sought to remind researchers and investigators of this important aspect.

According to Messick (1980), and Guion and Cranny (1982), the design characteristics essential for validity studies includes data-gathering procedures, the correct choice of variables to study, and proper conclusions to be drawn (Smith, 2005:397). This point was emphasized by Lawshe (1985) who advised researchers not to think of different types of validity, but rather of different types of validity analyses. By validity analyses, he ostensibly refers to the entire process of drawing sound conclusions from experimental investigations. From his viewpoint, the validation process ought to be understood as a system encompassing different conclusions from one's findings. "Landy (1986) encouraged adoption of Lawshe's (1985) perspective, noting its similarity to unique descriptions of the concept" (Smith, 2005:397).

### **3.3 DEFINING VALIDITY AND CONSTRUCT VALIDITY**

#### **3.3.1 Validity**

"The first pivotal development in the emergence of a unified approach to validity occurred in the 1950's and 1960's, when a threefold typology of content, criterion, and construct validity was officially established in reaction to the confusion generated by the earlier proliferation of types" (Adcock & Collier, 2001:529).

According to Wainer and Braun (1998), "[v]alidity ... is a unitary concept (Winter, 2000), but in reality, validity cannot be viewed as such." There is no single form, construct or concept that can universally define or encompass the term (Winter, 2000:np).

Validity was traditionally subdivided into three categories: content-, criterion-related-, and construct validity (Brown, 2000:231-249).

"*Content validity* includes any validity strategies that focus on the content of the test" (Brown, 2000:8). To demonstrate content validity, testers should examine the degree to which a test is a representative sample of the content



of whatever objectives or specifications the test was originally designed to measure (Brown, 2000:8). In order to investigate the degree to which test items match the test objectives of the test, test developers often enlist well-trained colleagues to make judgements.

*“Criterion-related validity* usually includes any validity strategies that focus on the correlation of the test being validated with some well-respected outside measure(s) of the same objectives or specifications” (Brown, 2000:8). In other words, criterion-related validity refers to the degree of association between the measure and some other accepted measure – the criterion (Price, 1997 in Van Vuuren, 2005:34).

*Construct validity* will be explained in more detail in the subsequent subsection. The main idea of construct validity, however, is to determine whether a test measures what it is supposed to measure. “Construct validity is the most general type of validity and actually subsumes the other two types of validity” (Van Vuuren, 2005:34).

The precise meaning of “validity” is a subject that is highly debated in educational research as well as social research, given the fact that no common definition of the term exists (Winter, 2000:1). In order to understand the meanings attached to “validity”, one needs to review a variety of the definitions provided by authors. It is important to note that one should firstly understand the concept of “validity” in order to understand “construct validity”, and therefore definitions of “validity” will firstly be provided and thereafter definitions of “construct validity” will be explained.

A well-known definition of “validity” is that of Hammersley (1987, in Winter, 2000:np): “An account is valid or true if it represents accurately those features of the phenomena that it is intended to describe, explain or theorise” (Winter, 2000:np). Although this definition appears to be a comprehensive definition of “validity”, many other definitions exist which one should investigate. The following are some of them: “An agreement between two efforts to measure

the same thing with different methods” (Campbell & Fick, nd.; Hammersley, 1987:np in Winter, 2000:np); “The measure that an instrument measures what it is supposed to” (Black & Champion, 1976:232-234, in Winter, 2000:np); “Accuracy” (Lehner, 1979:130, in Winter, 2000:np); “Degree of approximation of ‘reality’” (Johnston & Pennypacker, 1980:190-191, in Winter, 2000:np); “Are we measuring what we think we are?” (Kerlinger, 1964:430, in Winter, 2000:np); “To the extent that differences in scores yielded ... reflect actual differences” (Medley & Mitzel, nd; Hammersley, 1987 in Winter, 2000:np).

Taking all of the abovementioned definitions into account, two strands emerged. Firstly, whether the means of measurement are accurate and, secondly, whether they actually measure what they are intended to measure. A detailed discussion on construct validity follows below.

### **3.3.2 Construct Validity**

In order to understand what construct validity is, it is necessary to first explain what a construct is. A construct, or also known as a psychological construct, is an attribute, proficiency, ability, or skill that happens in the human brain and is defined by established theories (Brown, 2000:9).

According to the Social Sciences (<http://www.socialresearchmethods.net/kb/consthre.htm>), “construct validity refers to the degree to which inferences can legitimately be made from the operationalizations in your study to the theoretical constructs on which those operationalizations were based.”

According to Wainer and Braun (1998:np), validity that is concerned with quantitative research is known as ‘construct validity’ (Winter, 2000:np). The construct is the preliminary idea, notion, problem or hypothesis that determines which data one should gather and how one should gather it. “Wainer and Braun assert that quantitative researchers actively cause or affect the interplay between construct and data in order to ‘validate’ their investigation, usually by the application of a test or other process” (Winter,

2000:np). The data obtained can either support or reject the construct which, if supported, can be presented as a theory or, if rejected, as a further hypothesis (Cronbach & Meehl, 1955 in Winter, 2000:np).

According to Adcock and Collier (2001:529), construct validity has a wide variety of meanings. One main focus has been on measuring whether a particular indicator is empirically related to other indicators in such a way that conforms to hypothetical expectations about their interrelationship.

Construct validation was introduced in order to stipulate types of research necessary in developing tests, for which the conservative views on validation are inappropriate (Cronbach & Meehl, 1955:288). Personality tests and several other tests, such as that of ability or intelligence, are understood in terms of certain characteristics for which there exists inadequate criterion. The following points are particularly significant to point out which types of evidence can substantiate such interpretations and how such evidence is to be interpreted (Cronbach & Meehl, 1955:289):

- “A construct is defined implicitly by a network of associations or propositions in which it occurs. Constructs employed at different stages of research vary in definiteness.
- Construct validation is possible only when some of the statements in the network lead to predicted relations among observables. While some observables may be regarded as “criteria”, the construct validity of the criteria themselves is regarded as under investigation.
- The network defining the construct, and the derivation leading to the predicted observation, must be reasonably explicit so that validating evidence may be properly interpreted.
- Many types of evidence are relevant to construct validity, including content validity, inter-item correlations, inter-test correlations, test-

“criterion” correlations, studies of stability over time, and stability under experimental intervention. High correlations and high stability may constitute either favourable or unfavourable evidence for the proposed interpretation, depending on the theory surrounding the construct.

- When a predicted relation fails to occur, the fault may lie in the proposed interpretation of the test or in the network. Altering the network so that it can cope with the new observations is, in effect, redefining the construct. Any such new interpretation of the test must be validated by a fresh body of data before being advanced publicly. Great care is required to avoid substituting a posterior rationalisations for proper validation.
- Construct validity cannot generally be expressed in the form of a single simple coefficient. The data often permit one to establish upper and lower bounds for the proportion of test variance which can be attributed to the construct. The integration of diverse data into proper interpretation cannot be an entirely quantitative process.
- Constructs may vary in nature from those very close to “pure description” (involving little more than extrapolation of relations among observation-variables) to highly theoretical constructs involving hypothesized entities and processes, or making identifications with constructs of other sciences.
- The investigation of the test’s construct validity is not essentially different from the general scientific procedures for developing and confirming theories.”

Without promoting construct validity as the desired type of validity (as opposed to concurrent, predictive and content), it is essential that psychologists give consideration to it in their methodological thinking so that its rationale, scientific legitimacy and dangers may become clear and familiar (Cronbach & Meehl, 1955:290). One cannot predict and correct the baffling

influences of random error and method variance without assessing construct validity. Furthermore, the results of hypothesis testing may be vague. “That is, a hypothesis might be rejected or accepted because of excessive error in measurement, not necessarily because of the inadequacy or adequacy of theory” (Bagozzi, Yi & Phillips, 1991, in Cronbach & Meehl, 1955:290).

To summarise construct validity, the following five-step model is presented:

- “(1) careful specification of the theoretical constructs in question,
- (2) articulation of how the theory of the construct is translated into informative hypotheses,
- (3) specification of appropriate research designs to test one’s hypotheses,
- (4) articulation of how observations from samples pertain to one’s predictions, and
- (5) revision of the theory and the constructs” (Smith, 2005:399).

The prevalent criticism of the type of science influences all the above-mentioned steps of the process.

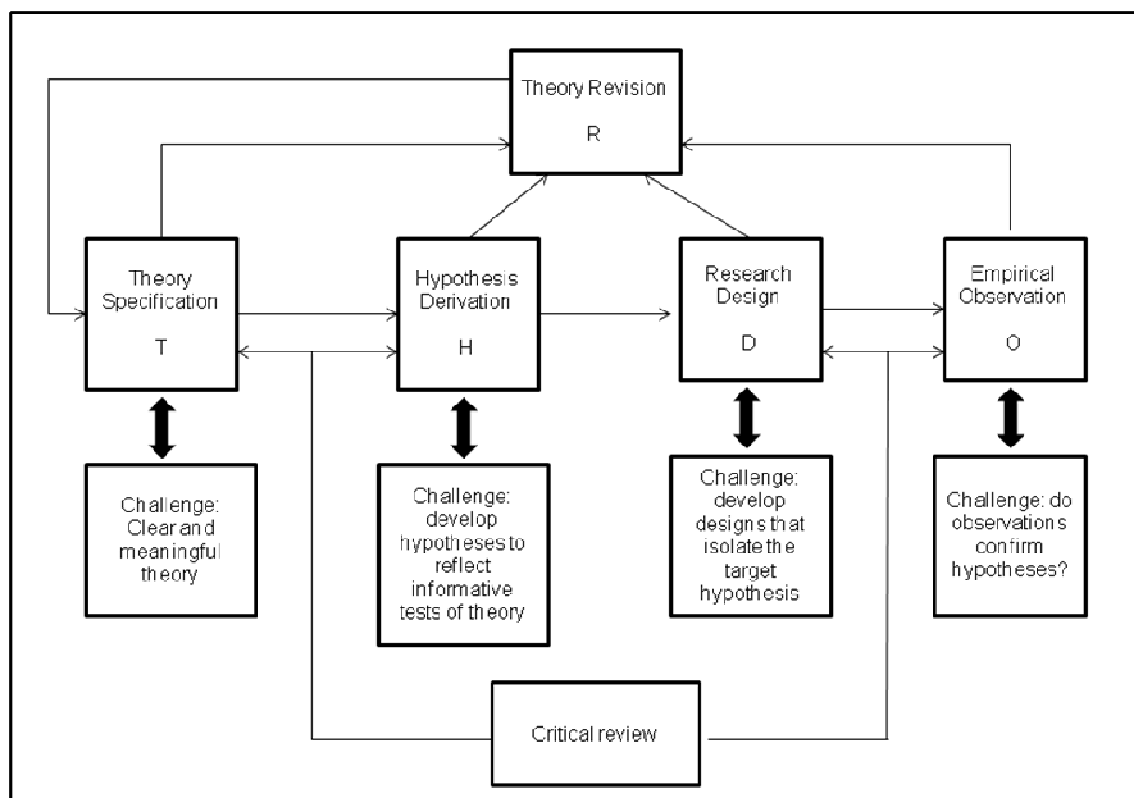
Various implications of this model are evident from the foregoing discussion (Smith, 2005:399).

- Firstly, cautious specification of hypothetical constructs is important for scientific assessment. Scientific measures that are likely to make an impact are those that stem from new, explanatory, or informative theory.
- Secondly, construct validation necessitate informative tests, which are tests that aid in the crucial review process of the characteristics of science.
- Thirdly, utilisation of sound and suitable research designs is vitally important for construct validation. essential
- Fourthly, the ability to decide how well observations from data match the hypotheses is important.

- Lastly, it is essential to understand that the construct validation process involves an ongoing, iterative process in which new findings and new theories explain and correct existing theories, thus requiring new measures and new theory tests (Haynes, Richard & Kubany, 1995, Weimer, 1979 in Smith, 2005:400).

Ongoing revisions of hypotheses, and the methods used to represent them, are part of the process of increasing the “truth content” (Lakatos, 1968 in Smith, 2005:400) of clinical theories. “The revision process can be triggered at any step in the construct validation process” (Smith, 2005:400).

A visual representation of the abovementioned five-step model for construct validation is presented below.



**Figure 3.1: Depiction of the five general steps in establishing construct validity**

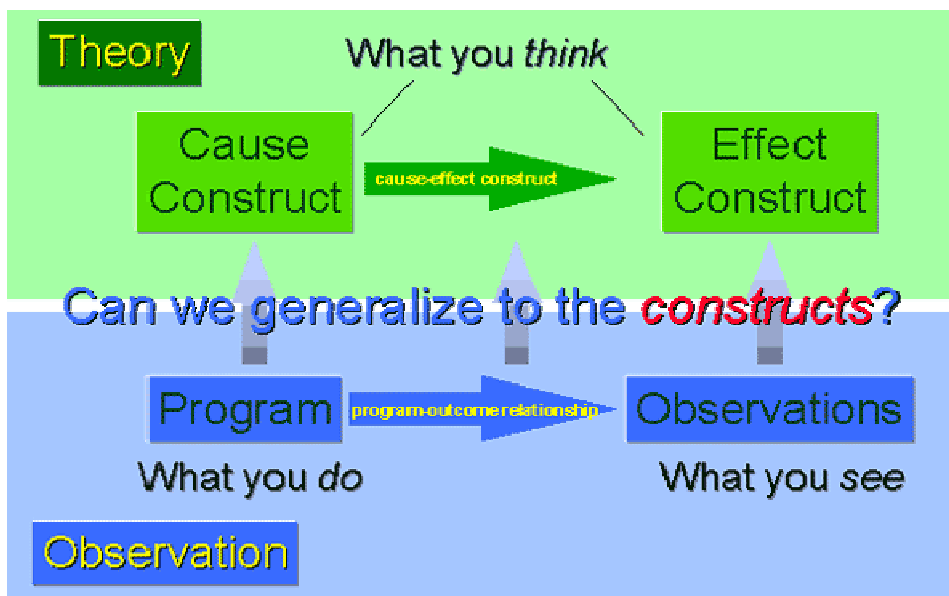
**T refers to theory,  
H refers to hypotheses,**

**D** refers to research design,  
**O** refers to empirical observations, and  
**R** refers to theory revisions.

The figure also depicts critical review of all steps in the process. Narrow arrows refer to paths of influence; broad arrows connect a step with a statement of the challenge that a researcher faces at that step (adapted from Smith, 2005:399)

### 3.4 THE IDEA AND LOGIC OF CONSTRUCT VALIDATION

When claiming that a measurement has construct validity, we are in essence claiming that we understand how the constructs or theories of the measures operate in theory, and we claim that we can provide evidence that they behave in practice in the way we think they should.



**Figure 3.2: Construct Validity (Source: Social Research Methods, <http://www.socialresearchmethods.net/kb/consthre.htm>)**

“The idea behind construct validation furthermore suggests that construct validation takes place when an investigator believes that his instrument reflects a particular construct, to which are attached certain meanings” (Cronbach & Meehl, 1955:285). The suggested interpretation creates

particular testable suggestions which are a method of substantiating or rejecting the statement.

Test validation can be viewed in the light of two viewpoints. The first viewpoint is from the opinion of the psychological practitioner where the burden of proof is on the test. Tests must not be utilised to measure a trait until it is established that the predictions made from such measures are reliable and based on the best available theory of that specific trait (Cronbach & Meehl, 1955:286). The second viewpoint is based on the opinion of the test developer where the test and the theory underlying the test are under examination.

The appropriate goals in reporting construct validity are to make the following understandable:

- (1) what interpretation is proposed;
- (2) how successfully the writer believes this interpretation is validated; and
- (3) what proof and interpretation led him to this belief (Cronbach & Meehl, 1955:286).

There are certain limitations if either one of the abovementioned goals are not present. For example, without “1” the construct validity of the test is of no use to the consumer; without “2” the consumer must carry the entire burden of evaluating the test research; and without “3” the consumer is being asked to take faith in “1” and “2”.

### **3.5 CONSTRUCT VALIDITY IN PERSONALITY RESEARCH**

According to Bagozzi (1993:49), construct validity, which is defined broadly as “the extent to which an operationalization measures the concept it is supposed to measure (e.g., Cook & Campbell, 1979:np), is a fundamental issue in personality research” (e.g., Ozer, 1989:np, in Bagozzi, 1993:49).



Measures of personality traits could reveal a measurement error as well as the theoretical content supposed to underlie the traits (Bagozzi, 1993:49). “Because measurement error (i.e., random error and method variance) provide potential threats to the interpretation of research findings, it is important to validate measures and disentangle the distorting influences of these errors in the course of testing personality theories” (Bagozzi, 1993:49). The following section explores construct validity in psychological tests.

### **3.5.1 Construct Validity in Psychological Tests**

As with this study, much of the current research on tests of personality is about construct validity. Construct validation is involved whenever a test is to be interpreted as a measure of some attribute or quality which is not “operationally defined” (Cronbach & Meehl, 1955:281). Generally, construct validity is examined when the test developer has no definite criterion measure equal to which he or she is concerned with and have to utilise indirect measures. Furthermore, construct validation is important for every type of psychological test at some stage during research. “Validation of psychological tests has not yet been adequately conceptualized, as the APA Committee on Psychological Tests learned when it undertook (1950-54) to specify what qualities should be investigated before a test is published” (Simon, 2008:np, in Cronbach & Meehl, 1955:282).

## **3.6 COMMON THREATS TO CONSTRUCT VALIDITY**

According to Brown (2000:10), “any threats to the reliability (or consistency) of a test are also threats to its validity because a test cannot be said to be any more systematically valid than it is first systematic (or consistent).” Threats to construct validity can arise for a number of reasons such as the choice of the treatment or the choice of the outcome. Some of the most well-known validity problems are an inadequate number of items, poor item-writing, lack of pilot-testing, lack of item analysis procedures, lack of reliability studies, and a lack of validity analysis. A detailed discussion of each problem will not be provided,

but it is necessary to take cognisance of the different problems, and, in turn, threats that may occur. These problems, however, are all problems that could be rectified by using the correct psychometric procedures.

According to the Social Research Methods (<http://www.socialresearchmethods.net/kb/consthre.htm>), the following are the main threats to construct validity:

- *“Inadequate preoperational explication of constructs: preoperational means before translating constructs into measures or treatments, and explication means explanation – in other words, you did not do a good enough job of defining (operationally) what you mean by the construct.*
- *Mono-Operation Bias:* Mono-operation bias pertains to the independent variable, cause, program or treatment in your study – it does not pertain to measures or outcomes.
- *Mono-Method Bias:* Mono-method bias refers to the measures or observations, not to your programs or causes.
- *Interaction of Different Treatments:* The result might be the combination of the separate programs they participated in not only yours.
- *Interaction of Testing and Treatment:* Does testing or measurement itself make the groups more sensitive or receptive to the treatment? If it does, then the testing is in effect a part of the treatment, it is inseparable from the effect of the treatment.
- *Restricted Generalizability Across Constructs:* Unintended consequences.
- *Confounding Constructs and Levels of Constructs:* Slight increases or decreases of the dosage may radically change the results.
- *The “Social” Threats to Construct Validity:*
  - ~ *Hypothesis Guessing:* Participants are likely to base their behaviour on what they guess about the study, not just on your treatment;
  - ~ *Evaluation Apprehension:* Many people are anxious about being evaluated (performed good and poorly);

- ~ *Experimenter Expectancies*: Sometimes the researcher can communicate what the desired outcome for a study might be (and participant desire to “look good” leads them to react that way). For instance, the researcher might look pleased when participants give a desired answer. If this is what causes the response, it would be wrong to label the response as a treatment effect.”

These are only a few of the threats to construct validity, and most experts agree that there are at least 24 different types of threats (<http://www.experiment-resources.com/construct-validity.html>). High-quality experimental design, together with acquiring feedback from experts during the planning stage, will help to avoid them.

### 3.7 RELIABILITY

“Reliability’ refers to the consistency of scores obtained by the same persons when they are re-examined with the same test on different occasions, or with different sets of equivalent items, or under other variable examining conditions” (Anastasi & Urbina, 1997:84). This concept of reliability underlies the computation of the *error of measurement* of a single score, whereby one can predict the range of fluctuation likely to occur in an individual’s score as a result of irrelevant or unknown chance factors (Anastasi & Urbina, 1997:84). Another definition of “reliability” is that of Foxcroft and Roodt (2005:28): “The reliability of a measure refers to the consistency with which it measures whatever it measures”.

According to Van Vuuren (2005:31), “Test reliability refers to the instrument’s degree of accuracy and consistency”. Reliability indicates the measure of confidence with which scores obtained with an instrument could be regarded. Reliability is comparative and can be influenced by the group to whom the instrument is administered (Van Vuuren, 2005:31). When used properly, reliability will specify what the relation is between the true scores and the observed scores. This is known as the standard error of measurement.

According to Van Vuuren (2005:32), “standard error of measurement provides an indication of the degree of inconsistency or error that one could expect with individual scores (Schaap in Erasmus & Schaap, 2003)”.

The best method to establish the reliability of a measure is to use it repeatedly on the same object (Smith & Robertson, 1986 in Van Vuuren, 2005:32). There are numerous ways in which the reliability of a measure can be estimated. Smith and Robertson (1986), distinguished between the following methods of obtaining the reliability coefficients (Van Vuuren, 2005:32-33):

- “Parallel form reliability is used when two equivalent/parallel versions of the same test are used on the same group, at different occasions.
- Test-retest reliability is used when the same test is re-administered to the same sample after a short time interval.
- Internal consistency. The homogeneity of the test items can be determined by the split-half reliability method, the Kuder Richardson’s formula or Cronbach’s alpha. The Kuder Richardson method is generally used where the items are scored in terms of passes or fails, whereas Cronbach’s alpha is used when items are scored on a continuum. Although recommendations vary, 0.70 is often viewed as the minimum acceptable level for alpha (Price, 1997 in Van Vuuren, 2005:33).”

It is important to remember that validity is not a prerequisite for an indicator to be reliable (Smith, 1991 in Van Vuuren, 2005:33). In order for a measure to be valid, it must, however, be reliable (Smith, 1991 in Van Vuuren, 2005:33). Reliability can thus be viewed as an essential but deficient requirement for validity.

### **3.8 SUMMARY**

Construct validity is one of the most well-known types of validity in the social sciences. According to the Social Sciences (<http://www.socialresearchmethods.net/kb/consthre.htm>), construct validity refers to “the degree to which

inferences can legitimately be made from the operationalizations in your study to the theoretical constructs on which those operationalizations are based.”

The current study’s objective is to examine the construct validity of the Life-Style Questionnaire from a South African perspective. From what is discussed in this chapter, it should be clear exactly what construct validity means and why it is of the utmost importance to determine whether or not a questionnaire actually measures the constructs it was designed to measure.

## **CHAPTER 4: RESEARCH METHODOLOGY AND METHODS**

### **4.1 INTRODUCTION**

When undertaking research in the Social Sciences, it is extremely important that any attempt to contribute to the field of knowledge about a particular subject, should be grounded on a scientifically sound basis. In order to show that a scientific research approach was followed in this study, the methodologies in terms of the research design, the sample, data collection, research instrument and statistical analysis are described in this chapter.

### **4.2 RESEARCH DESIGN**

#### **4.2.1 A description of the study's strategy of inquiry**

It is commonly accepted that each individual establishes his or her own specific goals in life and uses his or her own methods to reach them. To achieve these goals, two aspects are involved, namely the basic tendencies of all human beings to compensate for feelings of inferiority and to strive for superiority. An individual's lifestyle is set early in his or her life and this lifestyle tends to continue and to influence later preferences, values and beliefs throughout his or her lifespan. Several measurements have been developed to measure an individual's type or category of lifestyle, but the present study focuses on the Life-Style Questionnaire which categorises an individual in either one of five categories. These categories have already been discussed in detail and will therefore not be repeated.

Based on the above, the purpose was to determine whether or not the trait-descriptive lifestyle categories measure what the Life-Style Questionnaire states it measures. In other words, the study aimed to determine the construct validity of the Life-Style Questionnaire in the South African context. According to Saunders, Lewis and Thornhill (2007:594), "construct validity refers to the extent to which your measurement questions actually measure the presence

of those constructs you intended them to measure.” It is of the utmost importance that the correct research design is used in order to avoid obtaining insufficient results.

According to Lonner & Berry (1986, in Van den Bergh, 2008:52), the success of any research strategy depends on the relative degree of control that the researcher has over variables and factors influencing the study. Considering the nature of the research study, the most practical, economical and feasible design for this research project was a quantitative descriptive survey design. This choice was supported by previous studies where quantitative approaches have also been used to determine the construct validity of measurements of personality. Furthermore, the survey design is one of the most common methods of collecting primary data and is used to measure variables through questioning individuals about those specific variables (Van den Bergh, 2008:54).

For the purpose of this study, the quantitative method was applied. Data was collected by means of the Life-Style Questionnaire. The aim was to quantify the data in order to determine whether or not certain items could be excluded from the Life-Style Questionnaire. Furthermore, the categories and variables were examined in order to determine whether a factor analysis (FA) and confirmatory factor analysis (CFA) could be employed. The results of the examination sufficiently proved that factor and CFA should be employed.

#### **4.2.2 The basic characteristics of quantitative research**

“Quantitative research is a means for testing objective theories by examining the relationship among variables” (Cresswell, 2009:4). These variables can be measured by making use of instruments for obtaining data which can be analysed by using statistical procedures. Another definition which clearly defines “quantitative research” is provided by Maree (2007:np): “Quantitative research is a process that is systematic and objective in its ways of using numerical data from only a selected subgroup of a universe (or population) to

generalise the findings to the universe that is being studied.” There are three elements in this definition that distinguishes it from qualitative research, namely: (1) objectivity; (2) numerical data; and (3) generalisability.

There are therefore clear distinctions between quantitative and qualitative research. In order to make a well-informed decision regarding the inquiry of which strategy to apply, it was firstly necessary to investigate the differences. Table 4.1 presents the differences between quantitative and qualitative research approaches.

**Table 4.1: Distinguishing characteristics of quantitative and qualitative approaches**

<b>Question</b>	<b>Quantitative</b>	<b>Qualitative</b>
What is the purpose of the survey?	<ul style="list-style-type: none"> <li>• To explain and predict</li> <li>• To confirm and validate</li> <li>• To test theory</li> </ul>	<ul style="list-style-type: none"> <li>• To describe and explain</li> <li>• To explore and interpret</li> <li>• To build theory</li> </ul>
What is the nature of the research process?	<ul style="list-style-type: none"> <li>• Focused</li> <li>• Known variables</li> <li>• Established guidelines</li> <li>• Predetermined methods</li> <li>• Somewhat context-free</li> <li>• Detached view</li> </ul>	<ul style="list-style-type: none"> <li>• Holistic</li> <li>• Unknown variables</li> <li>• Flexible guidelines</li> <li>• Emergent methods</li> <li>• Context-bound</li> <li>• Personal view</li> </ul>
What is the data like?	<ul style="list-style-type: none"> <li>• Numeric data</li> <li>• Representative, large sample</li> </ul>	<ul style="list-style-type: none"> <li>• Textual and/or image-base data</li> <li>• Informative, small sample</li> </ul>
How is the data collected?	<ul style="list-style-type: none"> <li>• Standardised instruments</li> </ul>	<ul style="list-style-type: none"> <li>• Loosely structured or non-standardised observations and interviews</li> </ul>
How is data analysed to determine its meaning?	<ul style="list-style-type: none"> <li>• Statistical analysis</li> <li>• Stress on objectivity</li> <li>• Deductive reasoning</li> </ul>	<ul style="list-style-type: none"> <li>• Search for themes and categories</li> <li>• Acknowledgment that analysis is subjective and potentially biased</li> </ul>



		<ul style="list-style-type: none"> <li>• Inductive reasoning</li> </ul>
How are the findings communicated?	<ul style="list-style-type: none"> <li>• Numbers</li> <li>• Statistics, aggregated data</li> <li>• Formal voice, scientific style</li> </ul>	<ul style="list-style-type: none"> <li>• Words</li> <li>• Narratives, individual quotes</li> <li>• Personal voice, literacy style</li> </ul>

Source: Adapted from Leedy & Ormrod (2005:96)

From the preceding table, it is clear that when a questionnaire is used, quantitative research is the best option to follow.

#### 4.2.3 Surveys as a form of quantitative research

McMillan and Schumacher (2001) in Maree (2007:155) define survey research as “the assessment of the current status, opinions, beliefs, and attitudes by questionnaires or interviews from a known population”. Furthermore, according to McMillan and Schumacher (2001) and Crowther *et al.* (1994), “survey data is used to describe and explain the status of phenomena, to trace change and to draw comparisons” (Maree, 2007:155). There are many different ways in which surveys can be conducted and the importance of choosing the correct design should not be underestimated.

Survey designs should include various aspects in order to conduct the study properly. According to Crowther *et al.* (1994) in Maree (2007:156), survey designs should take all the relevant aspects of the survey process into account, including the following:

- Sampling issues, including the sampling strategy and sample size, as well as the minimum response rate that is acceptable;
- Questionnaire design issues;
- Interviewer issues, namely decisions regarding the nature of training and supervision that should be provided, as well as the gender and cultural background of the interviewers. Fraenkel and Wallen (2006:406, in Maree, 2007:156) maintain that “[b]oth telephone and face-to-face

interviewers need to be trained beforehand ... [even a] frown at the wrong time can discourage a respondent from even attempting to answer a question!"; and

- Lastly, the data collection method issues, for example telephone, mail, personal interview and e-mail.

From the above, it is clear that the best approach towards this specific quantitative research paper would be to conduct a survey.

### **4.3 SAMPLE**

A sample is a subset of a population. The main point that has to be considered when deciding on the sampling approach and method is the degree of representivity of the sample in relation to the population to which the results are to be generalised (Van den Bergh, 2008:55). Data for this study was collected from a sample as it was impossible to distribute the Questionnaire to the whole of South Africa, which, in this case, is the population focused on in this study. In this section the sampling plan is presented, entailing a short discussion on the target population, context and units of analysis; the sampling method; and the sampling size.

#### **4.3.1 Target population, context and units of analysis**

The target population for this study consisted of any individual living in South Africa. Race, age, language, qualification, income and other factors were not requirements for participating in this study, as the objective of the study was not to determine anything other but the construct validity of the Life-Style Questionnaire in the South African context. Even though factors such as language, age and race were not requirements to participate in the study, they were part of the biographical information of the Questionnaire. Furthermore, the Life-Style Questionnaire is a personality questionnaire and it was therefore assumed that other factors would not have had an influence on the

results. Given the primary objectives of the research, it was appropriate to target the intended population only.

“The units of analysis refer to entities about which a researcher wishes to draw conclusions” (Terre Blance & Durrheim, 2004, in Kotze, 2009:22). The units of analysis for this study were any individual living in South Africa, hence both the sample and the units of analysis are the same.

#### **4.3.2 Sampling method**

A non-probability convenience sampling approach was used in this study. This method does not make use of a random selection of population elements, therefore it would be dangerous to draw important conclusions about the population from it (Maree, 2007:176). However, as the objective of the study is not to draw any conclusions on a specific population, but rather to test a measurement instrument, the dangers of using non-probability sampling was eliminated. Non-probability sampling was used for reasons of convenience, practicality, cost-effectiveness and ease of application.

As mentioned above, convenience sampling was used in this study. According to Maree (2007:177), “this method refers to situations when population elements are selected based on the fact that they are easily and conveniently available”. Taking the target population into consideration, this sampling method was most suitable, as participants, or rather the sample, was selected at the convenience of the researcher. According to De Vos *et al.* (2002), the larger the population, the larger the sample size required for research purposes, and vice versa (Van den Bergh, 2008:56). The implication of moderately small sample sizes and the disadvantage of the sampling method are that the results of the study may not be generalisable to the entire population (Van den Berg, 2008:56). Due to the explorative nature of this study, the generalisability of results was not crucial to the interpretation of the results. The sample was obtained by electronically distributing the Life-Style Questionnaire to family members, friends and colleagues of the researcher.

These individuals, in turn, distributed the Questionnaire electronically to their families, friends and colleagues in South Africa. Participation was voluntarily.

### 4.3.3 Sample size

A convenience sample of 320 individuals living in South Africa was drawn with 301 unspoiled responses. Guadagnoli and Velicer (1988) suggest that, for the purposes of factor analytic research, a minimum sample size of between 100 to 200 respondents is sufficient in order to determine concrete solutions (Van den Bergh, 2008:57).

“The basic rule is, *the larger the sample, the better*” (Leedy & Ormrod, 2005:207). In quantitative research, the sample size is normally large. The question can now be asked: what is a large sample size? There exists controversy regarding the correct size of a sample. The question of what the size of a sample should be is very difficult to answer since there are a number of factors to consider. Three factors which mainly determine the sample size are:

- type of statistical analyses planned;
- accuracy of results required; and
- characteristics of the population.

(Maree, 2007:178)

To determine the minimum number of respondents required for the study, the general “rule of thumb”, recommended by De Villis, i.e., a ratio of five to ten subjects per item, was applied (1991, in Van den Bergh, 2008:57). The Life-Style Questionnaire consists of 50 items and therefore a minimum sample size of 250 participants of the population was required for this study. The sample size for this study was 301 and thus sufficient for the intended purpose.

#### **4.3.4 Sampling Error**

Regardless of one's attempts, it is not possible to select a sample that completely represents the population (Salkind, 2006:94). Certainly one could select the whole population as the sample, but that would defeat the purpose of selecting a sample (Salkind, 2006:94). "One way that the lack of fit between the sample and the population is expressed is as sampling error, which is the difference between the characteristics of the sample and the characteristics of the population from which the sample was selected" (Salkind, 2006:94).

An important question one is faced with, is whether or not to select a large sample in order to minimise sampling error. The larger the sample, the smaller the sampling error. In a census, for instance, there are no sampling errors since the sample consists of the entire population.

### **4.4 DATA COLLECTION AND INSTRUMENT**

As mentioned above, a research survey was employed for this study. Survey research normally entails face-to-face interviews, telephone interviews, or written questionnaires (Leedy & Ormrod, 2005:184). Primary data was collected by distributing the Life-Style Questionnaire electronically. When resources are limited, questionnaires are the most feasible approach to follow, as they are relatively inexpensive with a relatively high response rate. Given the nature of this study, this was the most suitable option.

#### **4.4.1 Survey methods**

Questionnaires and interviews are the two most common data collection methods for a survey research study. For the purpose of this study, a questionnaire was the most appropriate method, since interviewing a sample size of 301 participants would have been too time-consuming and not economically viable. An electronically-adapted version of the Life-Style Questionnaire was posted onto a website page where participants could

access the Questionnaire for completion. The link directing participants to the webpage was conveyed via electronic mail. Clear instructions regarding the completion of the Questionnaire were given and once completed, participants were required to submit the completed Questionnaire via the webpage, from where the researcher could automatically collate the data. Once the desired number of responses was received, the researcher deactivated the website page in question. Paper-and-pencil questionnaires were available upon request but no such requests were received by the researcher.

Questionnaires do have its disadvantages, the most common of which is a low return rate. Typically, the majority of people who receive questionnaires do not return them – resulting in a possible low return rate – and the people who do return them are not necessarily representative of the originally selected sample, especially when convenience sampling is used (Leedy & Ormrod, 2005:185). However, it was not a problem with this study as the response rate was astounding.

#### **4.4.2 Measurement Instrument**

“The Life-Style Questionnaire was developed as an objective means to measure into which of five trait-descriptive lifestyle categories (*aggressive, conforming, defensive, individualistic, or restrictive*) participants belong” (Driscoll & Eckstein, 2007:2). The Life-Style Questionnaire consists of 50 multiple-choice statements. Participants had to indicate what points (indicated at each scale) they would apply to a specific statement. The Life-Style Questionnaire is very easy to complete and does not include wording that is difficult to understand. The scales of the Questionnaire had been determined and, flowing from the different scales, the five trait-descriptive lifestyle categories established before the study was conducted.

The 50 items entailed in the Life-Style Questionnaire was rated on a four-point Likert scale. The following are the points on which the Questionnaire was measured (Driscoll & Eckstein, 2007:5):

- 4 points: True for you always or almost always;
- 3 points: True for you more than half the time;
- 2 points: True for you less than half the time; and
- 1 point: Never or almost never true for you.

From the abovementioned points, the five trait-descriptive lifestyle categories were extracted. These categories are: tigers, chameleons, turtles, eagles and salmon. Each category consists of ten items. The item numbers that make up a category is designed in such a way that it is not easily noticeable which item relates to which category. The original Questionnaire (including the measurement points) is attached as Appendix A.

The Life-Style Questionnaire included 50 multiple-choice items on the following constructs:

Construct	Item
Tiger	1, 6, 11, 16, 21, 26, 31, 36, 41, 46 = Total 10
Chameleon	2, 7, 12, 17, 22, 27, 32, 37, 42, 47 = Total 10
Turtle	3, 8, 13, 18, 23, 28, 33, 38, 43, 48 = Total 10
Eagle	4, 9, 14, 19, 24, 29, 34, 39, 44, 49 = Total 10
Salmon	5, 10, 15, 20, 25, 30, 35, 40, 45, 50 = Total 10

The Questionnaire was applied in the South African context and any individual living in South Africa could complete it. As previously mentioned, an online-format of the Life-Style Questionnaire was used to obtain the data and the response rate was excellent.

#### 4.4.3 Preparation of data analysis

Data was prepared for analysis by exporting the obtained responses to the Statistical Package for Social Sciences (SPSS). A unique number had already

been assigned to the Questionnaire for the purpose of this study. Each respondent was also assigned a number in order to prepare the various completed questionnaires for the data analysis. Detailed attention was a necessity during this stage as the questions each had a number, the responses was in number format (one to four) and the respondents each had a unique number as well.

Item and factor analyses were essential to conduct as both these techniques contribute to the determination of construct validity. The purpose of item analysis is to identify items that may not be suitable for use in the instrument (Maree, 2007:218), while the purpose of FA is to determine which items “belong together” in the sense that they are answered similarly and therefore measure the same underlying dimension or factor (Maree, 2007:219).

After careful consideration, it was determined that CFA was also necessary as item and factor analyses alone would not be able to provide sufficient evidence for the determination of construct validity. “Confirmatory factor analysis allows the researcher to estimate the factor pattern coefficients that link the observed variables and the latent variables” (De Bruin & Bernard-Phera, 2002:3). The correlations between the latent variables can also be estimated through CFA.

#### **4.4.4 Reliability**

The Life-Style Questionnaire is an existing questionnaire and therefore some evidence of the reliability thereof exists. The following is an example of a previous study conducted, with its reliability results.

“Twenty-five items were generated for each of the five life styles, and the resulting 125-item questionnaire was administered to two hundred subjects. Discrimination indices were computed, and the ten highest discriminators for each style were retained for use in the Life-Style Questionnaire. The range for each style of living was as follows: tiger (+.37 to +.51), chameleon (+.25 to



+0.44), turtle (+0.23 to +0.41), eagle (+0.41 to +0.55), and salmon (+0.22 to +0.37)” (Driscoll & Eckstein, 2007:2). Coefficients of determination were computed on the points, resulting in the relationship shown below:

	<b>Chameleon</b>	<b>Turtle</b>	<b>Eagle</b>	<b>Salmon</b>
<b>Tiger</b>	4.7%	1.0%	26.0%	9.4%
<b>Chameleon</b>		32.0%	2.6%	0.5%
<b>Turtle</b>			0.1%	0.4%
<b>Eagle</b>				8.8%

The means and standard deviations for the styles were computed as follows (Driscoll & Eckstein, 2007:2):

<b>Style</b>	$\bar{X}$	<b>SD</b>
Tiger	30.62	4.70
Chameleon	23.91	4.64
Turtle	24.23	5.05
Eagle	31.79	4.97
Salmon	22.36	3.99

#### 4.4.5 Validity and Construct Validity

This study was based on construct validity. Construct validity refers to the extent to which the measurement questions actually measure the presence of those constructs one intends to measure (Saunders, Lewis & Thornhill, 2007:367). Construct validity is normally used when referring to constructs such as attitude scales, aptitude and personality tests. As mentioned in Chapter 1, previous research has been conducted on construct validity (e.g. Green, 1955:np; Brown, 2000:8-12; Embertson, 2007:449-455) of the Life-Style Questionnaire (Praveen, Samuvel & Naachimuthu, 2007:18-21). Little is still known about the construct validity of this specific Questionnaire. It was therefore necessary to conduct further research on this topic.

#### 4.5 RESEARCH ETHICS

In a research context, ethics refers to the appropriateness of one's behaviour in relation to the rights of those who become the subject of one's work, or are affected by it (Saunders, Lewis & Thornhill, 2007:178). Furthermore, research ethics relates to questions about how one formulates and clarifies one's research topic, designs one's research, gains access, collects data, processes and stores one's data, analyses data, and reports one's research findings in a moral and responsible way (Saunders, Lewis & Thornhill, 2007:178).

Different ethical issues arise during the different stages of a research project. It should be mentioned that ethical considerations should be taken into account only in respect of issues pertaining to the specific study. The following ethical issues pertaining to this study are briefly discussed:

- *Informed consent.* Participant consent given freely and based on full information about participation rights and the use of data (Saunders, Lewis & Thornhill, 2007:184). Before participants could complete the

Questionnaire for this study, they were required to read their participation rights and the purpose for which the data would be used.

- *Right to withdraw.* Even after participants have consented to take part in a research project, they still maintain their right to withdraw (Saunders, Lewis & Thornhill, 2007:187). This means that even after signing or agreeing to participate, participants may, at anytime during the research process, withdraw their participation. In this research study, all the participants were made aware of this fact and their participation was voluntary.
- *Confidentiality and anonymity.* Once promises about confidentiality and anonymity have been given, it is of great importance to make sure that these are maintained (Saunders, Lewis & Thornhill, 2007:187). This aspect was respected and maintained throughout this research study. All the participants knew that their responses were anonymous and that it would be kept confidential. They were ensured that the completed questionnaires would be stored electronically and protected by a password, and therefore only the researcher would have access to the data.

Ethical issues are of paramount importance in any research study and therefore should always receive considerable attention.

#### **4.6 STATISTICAL DATA ANALYSIS**

The statistical programme SPSS was used to analyse the data that was obtained. This section deals with all the relevant statistics that were involved in this research study, including descriptive statistics, reliability, item analysis, FA, CFA and estimation and model fit.

## 4.6.1 Descriptive Statistics

“Through descriptive statistics, data is arranged, summarised and presented in such a way that the most meaningful and essential information can be extracted and interpreted from the dataset” (Van den Bergh, 2008:64). Biographical data is also often represented by means of descriptive statistics, in order to broaden the scope of interpretation.

Descriptive statistics in terms of the Life-Style Questionnaire were calculated. The initial analysis involved the generation of item statistics. Means, standard deviations, skewness, kurtosis, item-total correlations and coefficient alphas, were calculated to provide an indication of the item quality (Buys, Olckers & Schaap, 2007:34). These statistics provided an indication of the appropriateness of the subsequent analysis procedures. The focus here was only on descriptive statistics, which is about summaries of data in three ways (Maree, 2007:19):

- Through *location* or *centrality* (mean, mode and median – what statisticians call “measures of central tendency”).
- Through *dispersion* (range, variance and standard deviation – the spread of data around the average).
- Through measures of *shape* (skewness and kurtosis).

Each of the above terms will be discussed briefly in the ensuing subsections.

### 4.6.1.1 Measures of Central Tendency

“The *mean* ( $\bar{x}$ ) is the most commonly used measure of location and is calculated as the arithmetic average of all the data values” (Maree, 2007:187). The mean is familiar, easy to calculate and useful for symmetric distributions.

Two other well-known measures of central tendency are the median and the mode, but these statistics do not form part of this study and therefore will not be discussed.

#### **4.6.1.2 Measures of Dispersion**

According to Maree (2007:188), “the *range* ( $R$ ) of a distribution is simply the difference between the highest and lowest value, thus:

$$R = \text{highest value} - \text{lowest value}”$$

From the range an interquartile range (IQR) can be determined. The IQR is the range of the middle 50% of the data (Maree, 2007:188). In order to understand the calculation of the IQR, the quartiles of a distribution must be defined. The quartiles of a distribution split the distribution into four equal parts.

“The *variance* is a measure that quantifies the amount of spread of the data values around their mean value” (Maree, 2007:188). It is calculated as the average of the squared deviations of all values from their mean.

The *standard deviation*(s) is the square root of the variance (Maree, 2007:188). The standard deviation is used in an important strategy called standardisation, in which individual scores are standardised to ease the comparison of individual scores from different groups (Maree, 2007:189).

#### **4.6.1.3 Measures of Shape**

The *skewness* of a distribution is a measure that illustrates how far the distribution deviates from symmetry (Maree, 2007:189). If the data is spread out more to the upper end of the scale, in other words it has a longer “tail” to the right, the distribution is said to be skewed to the right or positively skewed. If, however, the data is more spread out to the left or lower end of the scale, the distribution is said to be skewed to the left or negatively skewed (Maree, 2007:189). The value of the skewness measure is zero for symmetrical distributions, while a positive value indicates a distribution that is positively

skewed and a negative value a negatively skewed distribution (Maree, 2007:189).

The *kurtosis* of a distribution is the measure that describes the amount of “peakedness” or “flatness” of a distribution (Maree, 2007:190). The measure is directly related to the standard deviation of the distribution. According to Maree (2007:190), “there are three main classifications of distributions, namely:

1. Kurtosis that is “normal”, or mesokurtic.
2. Kurtosis that is abnormally peaked, or leptokurtic.
3. Kurtosis that is abnormally flat, or platykurtic.”

Values of the kurtosis measure close to or equal to zero indicate “normal” kurtosis, positive values indicate that the distribution is leptokurtic and negative values indicate platykurtic distributions (Maree, 2007:190).

#### **4.6.2 Reliability**

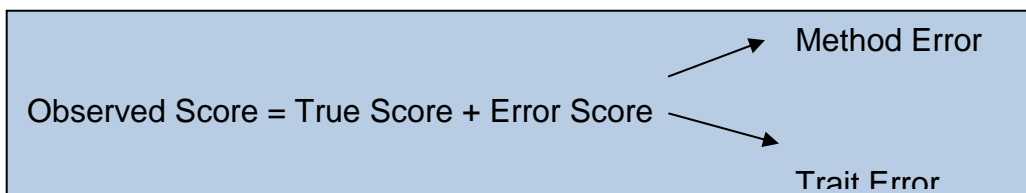
“Reliability’ refers to the consistency of scores obtained by the same persons when they are re-examined with the same test on different occasions, or with different sets of equivalent items, or under other variable examining conditions” (Anastasi & Urbina, 1997:84).

Reliability refers to scores (Salkind, 2006:106). According to Salkind (2006:106), the performance of any individual on any variable consists of one score which is made up of three clearly defined components, namely:

- “The *observed score* is the score you actually record or observe. It is the number of correct words on a test, the number of memorized syllables, the time it takes to read four paragraphs of prose, or the speed with which a response is given. It can be the dependent variable in your study or any other variable being measured. Any observed score consists of the two other components: true score and error score.

- The *true score* is a perfect reflection of the true value of that variable, given no other internal or external influences. In other words, for any person there is only one true score on a particular variable. After repeated measurements, there may be several values for a particular measurement, but there is only one true score. However, one can never ascertain what that true value is. Why? Firstly, because most variables, such as memory, intelligence and aggression, cannot be directly measured and, secondly, because the process of measurement is imperfect.
- The *error score* is all of those factors that cause the true score and the observed score to differ. Repeated scores on almost any variable are nearly always different from one another because the trait being assessed changes from moment to moment, and the way in which the trait is assessed also changes (albeit ever so slightly) and is not perfect (which no measurement device is). Error scores are made up of two elements that help to explain why true and observed scores differ. The first component of error scores is called *method error*, which is the difference between true and observed scores resulting from the testing situation. The second component is *trait error*. Here, the reason for the difference between the true and observed scores is characteristic of the person taking the test.”

The above discussion can also be visually represented as follows:



**Figure 4.1:** The components of reliability (adapted from Salkind, 2006:106)

A practical and understandable statistical concept called correlation, is used to measure reliability. The important aspect to consider regarding correlations

and reliability is that the more similar the scores are in terms of change from one time to another, the higher the correlation and the higher the reliability.

*“Reliability coefficients, which is more or less the same as correlation coefficients, range in value from -1.00 to +1.00. A value of 1.00 would indicate a perfect reliability where there is no error whatsoever in the measurement process. A value of 0.00 or less indicates no reliability”* (Salkind, 2006:109).

#### **4.6.2.1 Types of Reliability**

Reliability can be viewed as a theory, but it is also a convenient way to measure how consistent and stable an instrument or test is (Salkind, 2006:110). A variety of reliability types exists and each one is used for a different objective. For the purpose of this study, the type of reliability measurement that was used is “internal consistency”.

“Internal consistency examines how unified the items are in a test or assessment” (Salkind, 2006:112). To an extent, the following example should explain what internal consistency is: if a personality test, for example, is administered and the test includes 100 different items, one would want each of these items to be related, provided that the model or theory upon which the test is based, take into account that each of the 100 items reflect the same underlying personality construct. Similarly, if a test of 100 items were broken down into five different subscales that consist of 20 items each, it would be expected that the test has internal consistency for each of the subscales. This will only be the case if the items in each subscale relate closer to each other than to any of the items in the other four subscales. Each of the scales would have internal consistency if they relate closely to one another (Salkind, 2006:112-113). Internal consistency is assessed by correlating the performance on each item in a test or scale with the total performance of the test or scale. This then takes the form of a correlation coefficient. The most frequently statistical tools that are used are Cronbach’s alpha and Kuder-Richardson correlation coefficients (Salkind, 2006:113).



The alpha coefficients for the items of the Life-Style Questionnaire will be presented in Chapter 5, together with all the other results obtained.

### **4.6.3 Item Analysis**

“Item analysis adds value to the item development and the development of the measure in general” (Foxcroft & Roodt, 2005:52). The purpose of item analysis is to identify those items that are inappropriate for use in the instrument. There are certain item statistics that are calculated to assist the researcher in identifying those items (Maree, 2007:218). The statistics, together with the results, will be discussed in Chapter 5. Item analysis helps one to determine how difficult an item is, whether it discriminates between good and poor performers, and what the shortcomings of an item are (Foxcroft & Roodt, 2005:52).

### **4.6.4 Factor Analysis (FA)**

Factor analysis (FA) was applied in this study in order to determine the quantity of factors that underlie the set of measurements and to determine how many factors should be retained.

The purpose of FA is to determine which items “belong together” in the sense that they are answered similarly and therefore measure the same dimension or factor (Maree, 2007:219). Since the factor is common to the items measuring it, this technique is also known as common FA. Items measured on a 5- or 7-point Likert scale are well suited for FA. An item analysis should be performed prior to a FA so that the “bad” items can be identified and removed or replaced (Maree, 2007:219). A performed on a set of items produces, as its primary output, a factor loading matrix. This is a matrix that contains a loading on each factor for each item. These loadings are correlations between the items and factors, and big values are indicative of which items belong to which factor.

FA helps researchers to identify the basic dimensions that are necessary to summarise the original variables. FA also helps in understanding the nature of the dimensions that underlie the original variables. This is achieved by examining the nature or meaning of the variables that are grouped together in the dimension or factor. Although the aims of FA can be relatively easily understood on a conceptual level, the mathematics underlying the procedure is quite complex (Foxcroft & Roodt, 2005:156).

Furthermore, Huysamen (1998) states that FA is performed to identify clusters of items that show high correlations among themselves and lower correlations with items from other clusters (Van den Bergh, 2008:67). According to Van de Vijver and Leung (1997, in Van den Berg, 2008:67), the main aim of FA is to convey observed scores as scores on a limited set of underlying factors. By means of FA, these observed scores are decomposed into the underlying factors.

When relating each of the variables to each of the factors, it indicates whether the item is related to only one or more than one of the factors. The items that clearly relate to only one factor can be suggested as a scale for the construct underlying that factor.

“Some have asserted that factor analysis is the most important statistical approach demonstrating factorial validity, and in turn, the construct validity and structure of measures of constructs, affect, perception, or opinion” (Froman, 2001:1).

When used for instrument development, and predominantly when applied to concerns about construct validity, FA can generally be seen as a two-stage process. The first stage of FA offers a methodical way of examining the interrelationships among items on a scale. These interrelationships are used to reveal the clusters of items that have adequate differences to justify their grouping as a factor. The factors, in turn, are frequently interpreted as indicators of the latent constructs underlying responses to the instrument as a

whole. The purpose of the second stage of FA is to test specific propositions about item groupings and the construct itself (Froman, 2001:6).

The first stage or initial application of FA to a set of items or variables making up an instrument, is usually the first empirical exploration of what dimensions, or factors, contribute to the construct thought to underlie the responses to items. Although not technically conforming to all the requirements of rigorous hypothesis testing, this initial FA does test ideas.

According to Pallant (2005:173), there are three main steps in conducting FA:

**Step 1: Assessment of the suitability of the data for factor analysis (FA)**

There are two main issues to consider in determining whether a particular data set is suitable for FA: the sample size and the strength of the relationship among the variables. While there is little agreement among authors concerning how large a sample should be, the recommendation is generally: the larger, the better. In small samples the correlation coefficients among the variables are less reliable, tending to differ from sample to sample. Factors obtained from small data sets do not generalise as well as those derived from larger samples. Tabachnick and Fidell (2001, in Pallant, 2005:174), review this issue and suggest that “it is comforting to have at least 300 cases for factor analysis”. However, they do not concede that a smaller sample size (e.g. 150 cases) should be sufficient if solutions have several high loading marker variables (above .80). Some authors suggest that it is not the overall sample size that is of concern, but rather the ratio of subjects to items.

The second issue of concern is the strength of the inter-correlations among the items. Tabachnick and Fidell (2001, in Pallant, 2005:174), recommend an inspection of the correlation matrix for evidence of coefficients greater than 0.3. If a small number of correlations above this level is found, then FA may not be appropriate. There are two statistical measures to help assess the factorability of the data: Bartlett’s test of sphericity (Bartlett, 1954 in Pallant, 2005:174) and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy

(Kaiser, 1970 & 1974, in Pallant, 2005:174). “The Bartlett’s test of sphericity should be significant ( $p < .05$ ) for the factor analysis to be considered appropriate. The KMO index ranges from 0 to 1, with 0.6 suggested as the minimum value for a good factor analysis” (Tabachnick & Fidell, 2001, in Pallant, 2005:174).

## **Step 2: Factor extraction**

Factor extraction involves determining the least quantity of factors that can be used to best represent the interrelations among the set of variables. There are a variety of approaches that can be used to identify the number of underlying factors or dimensions. Some of the most commonly available extraction techniques are:

- principal components;
- principal factors;
- image factoring;
- maximum likelihood factoring;
- alpha factoring;
- unweighted least squares; and
- generalised least squares.

The most commonly used approach is principal components analysis. It is up to the researcher to determine the quantity of factors that he or she considers best describes the underlying relationship among the variables. This analysis involves balancing two conflicting needs: the need to find a simple solution with as few factors as possible, and the need to explain as much of the variance in the original data set as possible. Tabachnick and Fidell (2001, in Pallant, 2005:175) recommend that researchers take on an exploratory approach, experimenting with different numbers of factors, until a satisfactory solution is found.

There are a variety of techniques that can be used to assist in the decision concerning the number of factors to retain. The following three techniques are the ones most commonly used:

- *Kaiser's criterion*: One of the most commonly used techniques is known as Kaiser's criterion, or the eigenvalue rule. When using this rule, only factors with an eigenvalue of 1.0 or more are retained for further investigation. The eigenvalue of a factor represents the amount of the total variance explained by that factor. Kaiser's criterion has been criticised, however, as resulting in the retention of too many factors in some situations.
- *Scree test*: Another approach that can be used is Cattell's scree test (Cattell, 1966, in Pallant, 2005:175). This test involves plotting each of the eigenvalues of the factors and inspecting the plot to find a point at which the shape of the curve changes direction and becomes horizontal. Cattell (1966, in Pallant, 2005:175), recommends retaining all factors above the elbow, or break in the plot, as these factors contribute the most to the explanation of the variance in the data set.
- *Parallel analysis*: An additional technique gaining widespread popularity, particularly in the social science literature (e.g. Choi, Fuqua & Griffin, 2001; Stober, 1998), is Horn's parallel analysis (Horn, 1965). Parallel analysis entails comparing the size of the eigenvalues with those obtained from a data set of the same size. Only those eigenvalues that exceed the corresponding values from the data set are then retained. This approach has shown to be the most accurate to identify the correct number of components to retain, as both Kaiser's criterion and Cattell's scree test tend to overestimate the number of components (Hubbard & Allen, 1987:np; Zwick & Velicer, 1986:np, in Pallant, 2005:175).

### **Step 3: Factor rotation and interpretation**

After the number of factors has been determined, the next step is to try and

interpret them. To assist in this process, the factors are “rotated”. This does not change the underlying solution – rather, it presents the pattern of loadings in a manner that is easier to interpret. There are two main approaches to factor rotation, resulting in either orthogonal (uncorrelated) or oblique (correlated) factor solutions. According to Tabachnick and Fidell (2001), orthogonal rotation results in solutions that are easier to interpret and report, however, they do require the researcher to assume that the underlying constructs are independent (not correlated). Oblique approaches allow for the factors to be correlated, but they are more difficult to interpret, describe and report (Tabachnick & Fidell, 2001, in Pallant, 2005:176). These two approaches normally result in very similar solutions. Generally researchers conduct both orthogonal and oblique rotations and then report the approach which is the clearest and easiest to interpret.

There are different rotation techniques available within the two broad categories of rotational approaches. The most commonly used orthogonal technique is the Varimax method and the most commonly used oblique technique is Direct Oblimin. Direct Oblimin will be used in this study.

#### **4.6.5 Confirmatory Factor Analysis (CFA)**

“Harvey *et al.* (1985) proposed that using confirmatory factor analysis, allows researchers to formulate and directly test competing hypotheses regarding the underlying factor structure” (Buys, Olckers & Schaap, 2007:34).

After the initial first stage of FA, items are either discarded or retained and interpreted. At this time, many researchers progress to a subsequent stage of FA, called confirmatory factor analysis (CFA).

CFA signifies the actual testing of hypotheses about structures underlying responses to individual items on an instrument. In CFA, the following are tested: hypotheses about specified factors, parameter estimation, how the

factors are arranged in a larger model, and how much of an underlying construct the factors can explain (Froman, 2001:8).

Generally, it is the belief of CFA supporters that researchers should have a strong theory which underlies their measurement model before they analyse data (Williams, 1995, in Hurley *et al.*, 1997:667). According to Hurley *et al.*, (1997:667), “CFA is often used in data analysis to examine the expected causal connections between variables.” CFA is best defined as an assessment rule to accept or reject one or more hypotheses about a population factor structure based on sample data. In other words, CFA is about hypothesis testing (Hurley *et al.*, 1997:668). Regretably, techniques that are generally used in CFA do not always match up to the hypotheses one has in mind when employing them. The most appropriate use of CFA would be to hypothesise a set of parameters (i.e. factor loadings, correlations and uniquenesses) and then test the fit of the reproduced matrix to the sample data without approximating any parameters based on the sample data (Hurley *et al.*, 1997:668).

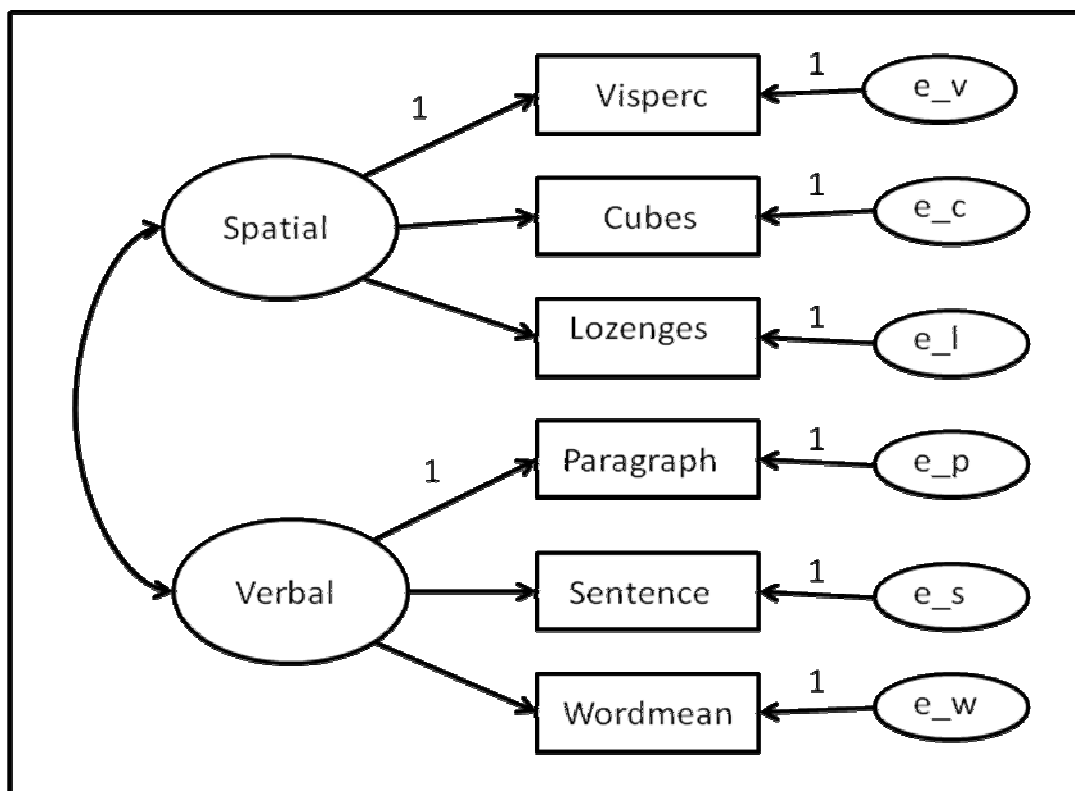
Often researchers want to show that their items hold relatively little common variance other than that associated with a single, substantive factor. “The use of CFA addresses this issue only indirectly, in that the inappropriate restriction to zero of factor loadings (for factors other than the intended one) is reflected in relatively lower goodness-of-fit values” (Hurley *et al.*, 1997:674). This will become more evident when looking at the results and their discussion in Chapter 5.

CFA thus helps ensure that the researcher considers relationships between data and theory and does not just collect data and “grind it” through exploratory procedures (Hurley *et al.*, 1997:672).

FA presumes that the co-variances between a set of observed variables can be explained by a smaller number of underlying latent factors (Hox & Bechger, nd:3). In FA, one will proceed as if you have no hypothesis about

the number of latent factors and the relations between the latent factors and the observed variables. Statistical procedures are used to estimate the number of underlying factors and the factor loadings. In exploratory FA, the model is arbitrary: *all* variables load on *all* factors (Hox & Bechger, nd:3).

In contrast, the path diagram in Figure 4.2 represents a clear hypothesis about the factor structure. Models like these are called restricted or CFA models (Hox & Bechger, nd:3). This diagram is only an illustration of how CFA works.



**Figure 4.2: Confirmatory Factor Analysis (CFA)** (adapted from Holzinger & Swinford data in Hox & Bechger, nd:3)

In general, some of the factor loadings are fixed to be zero. In Figure 4.2, the absence of arrows going from the verbal factor to “visperc,” “cubes” and “lozenges,” signify that the corresponding loadings in the factor matrix are fixed to zero. Similarly, the loadings of “paragraph,” “sentence” and “wordmean” on the spatial factor are also fixed to zero. The factor model in



Figure 4.2 demonstrate a perfect simple structure: each variable loads only on one factor. CFA can specify such a structure exactly and test whether it is feasible (Hox & Bechger, nd:3).

CFA is one of the models of structural equation modeling (SEM). In SEM, the confirmatory factor model is imposed on the data. In this case, there are two purposes of SEM. Firstly, it aims to obtain estimates of the *parameters* of the model, i.e. the factor loadings, variances and co-variances of the factor, and the residual error variances of the observed variables (Hox & Bechger, nd:3). Secondly, it assesses the fit of the model, i.e. to assess whether the model itself provides a good fit to the data. SEM will be discussed under the ensuing subsection.

#### **4.6.6 Structural Equation Modeling (SEM)**

Two approaches to CFA, are the traditional approach and structural equation modeling (SEM). The SEM approach will be used in this study. SEM is a common statistical modeling technique which is generally employed in the behavioural sciences. It is viewed as a combination of FA and regression or path analysis. The theoretical constructs, which are represented by the latent factors, are often of interest in SEM (Hox & Bechger, nd:3). “SEM provides a very general and convenient framework for statistical analysis that includes several traditional multivariate procedures, for example factor analysis, regression analysis, discriminant analysis, and canonical correlation, as special cases” (Hox & Bechger, nd:1).

The modern approach for conducting scientific research rests on the development of sound theoretical frameworks followed by thorough testing of these theories. SEM is an often-adopted technique. “SEM is particularly valuable in inferential data analysis and hypothesis testing where the pattern of inter-relationships among the study constructs are specified a priori and grounded in established theory” (Hoe, 2008:76). Furthermore, SEM has the flexibility to model relationships among various predictor and criterion

variables, and statistically tests a theoretical assumption against empirical data through CFA (Chin, 1998, in Hoe, 2008:76). Generally, SEM is applied to test “causal” relationships among variables.

When applying SEM for analytical procedures, there are many issues involved. “These issues may concern various overall fit indices and selection of the appropriate approach” (Lei & Wu, 2007, in Hoe, 2008:76).

#### **4.6.7 Estimation and Model Fit**

##### **4.6.7.1 Estimation**

Fitting a model to data in essence means solving a set of equations (Hox & Bechger, nd:8). On the one hand, there is a model with its parameters, whose values one wish to estimate. On the other hand, there are the sample statistics that one “knows” to be good estimates of the corresponding population values. According to Hox and Bechger (nd:np), the basic model in statistical modelling is: “*DATA = MODEL + ERROR.*” Even though it will not be discussed, there are various estimation procedures that can be used.

##### **4.6.7.2 Model Fit: Goodness-of-Fit Indices**

The statistical tests that are commonly used for model fit have the problem that their power varies according to the sample size (Hox & Bechger, nd:8). If the sample size is very big, then the statistical test will almost definitely be significant. Thus, with large samples, we will always reject our model, even if the model actually describes the data very well. On the other hand, with a very small sample, the model will always be accepted, even if it fits rather badly (Hox & Bechger, nd:8).

Various indicators of goodness-of-fit exists and generally SEM experts recommend evaluating the models by observing more than only one of these indicators. Marsh, Bella and McDonald (1988,np), “proposed that the criteria

for ideal fit indices are relative independent of sample size, accuracy and consistency to assess different models, and ease of interpretation aided by a well-defined pre-set range” (Hoe, 2008:77).

Based on this criterion, Garver and Mentzer (1999,np, in Hoe, 2008:76) recommended the following:

- Non-normed fit index (NNFI);
- Comparative fit index (CFI); and
- Root mean square approximation of error (RMSEA).

The NNFI which is also known as the Tucker-Lewis index, compares a proposed model’s fit to a nested baseline or null model. Furthermore, “NNFI measures parsimony by assessing the degrees of freedom from the proposed model to the degrees of freedom of the null model” (Hoe, 2008:77). NNFI is highly recommended as it seems resilient against variations in sample size. An acceptable value for this index is 0.90 or greater (Hoe, 2008:77).

“Bentler (1990), developed the CFI as a non-centrality parameter-based index to overcome the limitation of sample size effects” (Hoe, 2008:77). This index ranges from 0 to 1, with a value of 0.90 indicating an acceptable fit.

A fairly modern approach to model fit is to accept that models are only approximations, and that perfect fit may be too much to ask for (Hox & Bechger, nd:9). Instead, the problem is to assess how well a given model approximates the true model. According to Hox and Bechger (nd:9), this assessment led to the development of an index called root mean square error of approximation (RMSEA). RMSEA is a very informative criterion in evaluating model fit. “The RMSEA index measures the discrepancy between the observed and estimated covariance matrices per degree of freedom” (Steiger, 1990, in Hoe, 2008:78). As with NNFI and CFI, the values range between 0 and 1. If the approximation is good, the RMSEA should be small. Usually an RMSEA of smaller than 0.05 is required, and statistical tests or confidence intervals can be computed to test if the RMSEA is significantly

larger than this lower bound (Hox & Bechger, nd:9). Values up to 0.08 indicate a reasonable fit and values between 0.08 and 0.10 indicate a poor fit (Hoe, 2008:78).

All goodness-of-fit measures are some function of the chi-square and the degree of freedom. Most of these fit indices not only consider the fit of the model, but also its simplicity. “In general, there is a trade-off between the fit of a model and the simplicity of a model” (Hox & Bechger, nd:9). Because of this, several goodness-of-fit indices have been proposed to assess both the fit and the simplicity of a model simultaneously (Hox & Bechger, nd:9). The aim is to produce a goodness-of-fit index that does not depend on the sample size or the distribution of the data. In fact, the majority of goodness-of-fit indices depend on the sample size and the distribution, but the dependency is much smaller than that of the routine chi-square test (Hox & Bechger, nd:9).

The chi-square test is one of the most common tests to measure the goodness-of-fit. The chi-squared test is applicable in situations where the researcher wants to examine the relationship or association between two nominal variables. The chi-squared test is sometimes also known as the chi-square test for independence as it is used to test whether two variables are independent or dependent (related) (Maree, 2007:246). A low chi-square value indicates non-significance and would point to a good fit (Hoe, 2008:78). The reason for this is because chi-square tests are used to assess actual and predicted matrices. “Thus, non-significance means that there is no considerable difference between the actual and predicted matrices” (Hair *et al.*, 1998, in Hoe, 2008:78). Low chi-square values, which result in significance levels greater than 0.05 or 0.01, indicate that actual and predicted inputs are not statistically different (Hoe, 2008:78).

According to Pallant (2005:287), there are two different types of chi-square tests, both involving categorical data:

- “The chi-square for goodness of fit (also referred to as one-sample chi-square) explores the proportion of cases that fall into the various categories of a single variable, and compares these with hypothesised values.
- The chi-square test for independence is used to determine whether two categorical variables are related. It compares the frequency of cases found in the various categories of one variable across the different categories of another variable.”

It should be noted that the chi-square test does have its disadvantages, such as that it is not normed and that it is very dependent on the sample size. Because of the sensitivity of the chi-square statistic for sample size, researchers have proposed a variety of alternative fit indices to assess model fit (Hox & Bechger, nd:8).

#### **4.6.7.3 Modification Indices**

If the fit of a model is not sufficient, it has become common practice to modify the model, either by deleting parameters that are not significant, or adding parameters that would improve the fit (Hox & Bechger, nd:9). To assist in this process, most statistical software can compute *modification indices* for each fixed parameter. The value of a given modification index is the minimum amount that the chi-square statistic is expected to decrease if the corresponding parameter is freed.

At each stage, a parameter is freed that produces the largest improvement in fit, and this process is continued until an adequate fit is reached (Hox & Bechger, nd:9). For example, if in a confirmative factor model a loading that is fixed to zero shows a large modification index, one may want to free this parameter and estimate its value. This will improve the fit of the model. Coupled with the sequential model modification is the danger of capitalisation on chance properties of the sample. Generally, the advice is to apply

modifications only when there is a theoretical justification for them (Hox & Bechger, nd:9).

#### **4.7 SUMMARY AND CONCLUDING REMARKS**

This study was conducted from a Social Sciences perspective with the aim of determining the construct validity of the Life-Style Questionnaire in the South African context. A quantitative survey research design was used for the study. Data was collected by means of the Life-Style Questionnaire. The aim was to quantify the data in order to determine whether or not certain items could be excluded from the Life-Style Questionnaire. A non-probability convenience sampling approach was used and the sample consisted of 301 individuals living in South Africa.

A short discussion on the ethical issues pertaining to the study was provided. It is important to remember that ethical issues are of paramount importance in any research study and therefore should always receive the utmost attention.

An in-depth discussion on the statistical data analysis, including descriptive statistics, reliability, item analysis, FA, CFA, SEM, and estimation and model fit was provided. This chapter should provide a greater insight and understanding as to why construct validity in psychological testing is so important and that the determination thereof is very complex.

Chapter 5 provides the results of the study and how it is related to the information provided in this chapter.

## **CHAPTER 5: RESULTS AND DISCUSSION**

### **5.1 INTRODUCTION**

This chapter provides an overview of the results obtained from the statistical analysis of the responses to the Life-Style Questionnaire. The sample yielded 301 useable questionnaires and the results were subjected to the selected statistical analysis described in Chapter 4. The Statistical Package for the Social Sciences (SPSS) and EQS programme were used to conduct the data analysis. This chapter presents the results together with a discussion thereof.

### **5.2 PARTICIPANTS**

The Life-Style Questionnaire was administered to a population group, namely any individual living in South Africa. A sample was obtained by electronically distributing the Life-Style Questionnaire to family members, friends and colleagues of the researcher. These individuals in turn distributed the Questionnaire to their families, friends and colleagues in South Africa. A total of 320 responses were obtained for this study which yielded 301 useable responses.

#### **5.2.1 Biographical Variables of the Participants**

The following section provides an overview of the sample group in terms of language, ethnic group and age.

##### **5.2.1.1 *Language***

The language distribution of the sample is depicted in Table 5.1. The majority of the respondents are Afrikaans speaking. English-speaking respondents are less than half the Afrikaans-speaking respondents and three respondents indicated that their home language is a combination of Afrikaans and English.

Only two respondents are Xhosa speaking, one Shona speaking and the other respondent's home language is Tamil.

**Table 5.1: Language Distribution of the Sample**

	Afrikaans	English	Afr/Eng	Xhosa	Shona	Tamil	TOTAL
<b>Frequency</b>	198	96	3	2	1	1	<b>301</b>
<b>Row %</b>	65.78	31.89	1.00	0.66	0.33	0.33	

### 5.2.1.2 Ethnic Group

Almost all the respondents were White with only four Black, two Coloured and five Indian respondents. One respondent indicated that he or she did not belong to any of these ethnic groups. The ethnic distribution of the sample is depicted in Table 5.2.

**Table 5.2: Ethnic Distribution of the Sample**

	White	Black	Coloured	Indian	Other	TOTAL
<b>Frequency</b>	289	4	2	5	1	<b>301</b>
<b>Row %</b>	96.01	1.33	0.66	1.66	0.33	

### 5.2.1.3 Age

The majority of the sample ranged between the ages of 20 and 30 years. There were not much difference in the frequency of the sample in terms of the three age groups of 31-40, 41-50 and 51-60. Only two respondents were over the age of 60. The age distribution of the sample is depicted in Table 5.3.



**Table 5.3: Age Distribution of the Sample**

	20-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	Over 60 yrs	TOTAL
Frequency	136	54	67	42	2	<b>301</b>
Row %	45.18	17.94	22.26	13.95	0.66	

Even though it is assumed that the biographical information of the sample had no influence on the results for the determination of construct validity of the Life-Style Questionnaire, it does give an indication of the distributions in terms of language, ethnic group and age. The majority of the sample consisted of White, Afrikaans-speaking individuals between the ages of 20 and 30.

### 5.3 FACTOR ANALYSIS (FA)

A factor analysis (FA) was conducted in order to determine the quantity of factors that underlie the set of measurements and to determine which items measure the same underlying construct. When an FA is performed on a set of items, it produces a factor-loading matrix that contains, for each item, a loading on each factor. These loadings are the correlations between the items and the factors, and high values are indicative of which item belongs to which factor.

The items tested on the sample were inter-correlated and subjected to FA. Based on Cattell's scree plots, Kaiser's eigenvalues and the chi-square goodness-of-fit statistics, there were five factors extracted, which were rotated to a simple structure with the direct oblimin rotation. The FA on the sample produced five factors explaining most of the variances in the Questionnaire.

As mentioned in Chapter 4, there are three main steps in conducting an FA.

The first step involves the *assessment of the suitability of the data for factor analysis*. The two main issues to consider in determining whether a data set is suitable for an FA, is the sample size and the strength of the relationship

among the variables. With regard to the sample size, Tabachnick and Fidell (2001:588, in Pallant, 2005:174), reviewed the sample size issue and suggested that “it is comforting to have at least 300 cases for factor analysis”. The sample size of this study is thus large enough for an FA. The second issue of concern is the strength of the inter-correlations among the items. Tabachnick and Fidell (2001:588, in Pallant, 2005:174), recommend an inspection of the correlation matrix for evidence of coefficients greater than 0.3. If a small number of correlations above this level are found, then an FA may not be appropriate.

In essence, it means that the inter-correlations among the items should be as close to 1 as possible. The results yielded an anti-image matrix, which indicated that all the values were close to 1 and therefore, according to this matrix, there were no indication that any item should be excluded from the FA. It should be mentioned that the anti-image matrix is too outsized to visually represent it.

Furthermore, there are two statistical measures to help assess the factorability of the data: Bartlett’s test of sphericity (Barlett, 1954:np, in Pallant, 2005:174), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1970:np, 1974:np, in Pallant, 2005:174). “The Bartlett’s test of sphericity should be significant ( $p < .05$ ) for the factor analysis to be considered appropriate. The KMO index ranges from 0 to 1, with 0.6 suggested as the minimum value for a good factor analysis” (Kaiser, 1970:np, 1974:np, in Pallant, 2005:174). Table 5.4 represents the results that were obtained from the data analysis.

**Table 5.4: KMO and Barlett's Test**

KMO and Barlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.849
Barlett's Test of Sphericity	Approx. chi-square	5256.472
	df	1225
	Sig.	0

The Kaiser-Meyer-Olkin value is 0.849, exceeding the minimum recommended value of 0.6. The Barlett's test of sphericity reached statistical significance ( $p < .05$ ) and therefore according to these values, the FA is considered appropriate.

The second step of FA involves *factor extraction*. Factor extraction involves determining the least quantity of factors that can be used to best represent the interrelations among the set of variables. As mentioned in Chapter 4, there are a variety of approaches that can be used to identify the number of underlying factors or dimensions. Tabachnick and Fidell (2001 in Pallant, 2005:175) recommend that researchers take on an exploratory approach, experimenting with different numbers of factors until a satisfactory solution is found. The most commonly used approach is principal components analysis. Table 5.5 represents the results obtained from the principal components analysis.

**Table 5.5: Principal Components Analysis**

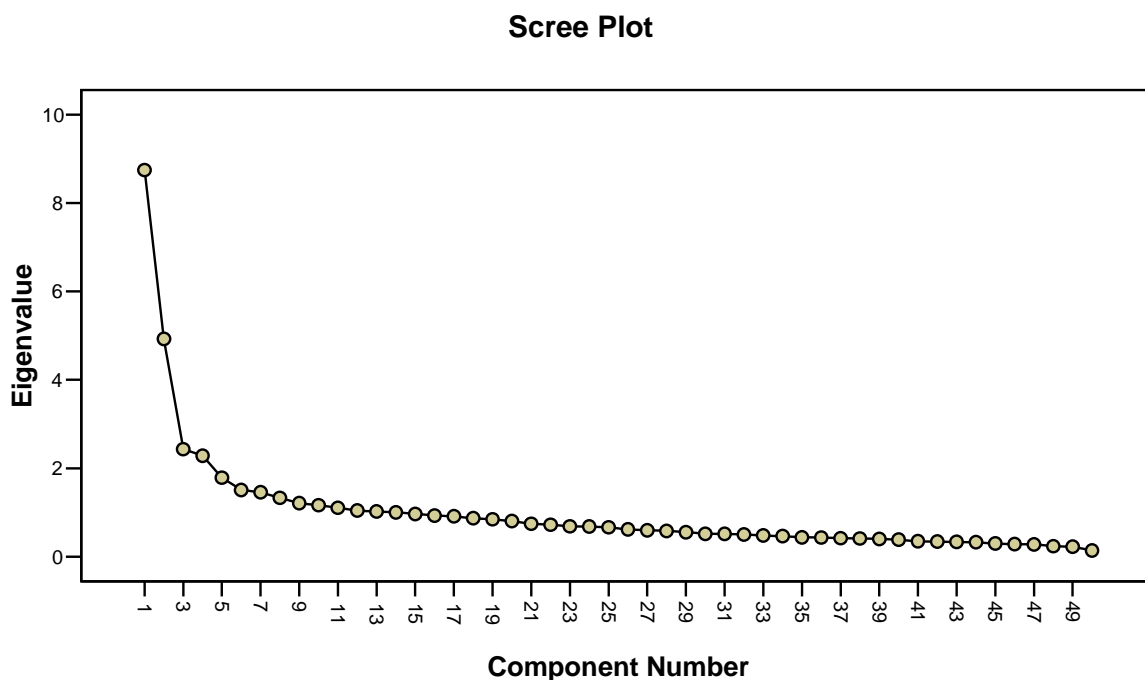
Component	Initial eigenvalues			Rotation sums of squared loadings(a)
	Total	% of variance	Cumulative %	Total
1	8.745	17.491	17.491	6.612
2	4.927	9.853	27.344	4.955
3	2.43	4.861	32.205	5.105
4	2.285	4.569	36.774	2.449
5	1.787	3.574	40.348	4.169
6	1.508	3.017	43.365	
7	1.457	2.913	46.278	
8	1.33	2.661	48.939	
9	1.211	2.422	51.361	
10	1.164	2.329	53.689	
11	1.107	2.213	55.903	
12	1.044	2.088	57.991	
13	1.021	2.042	60.033	
14	1.003	2.006	62.039	
15	0.968	1.935	63.975	
16	0.93	1.861	65.836	
17	0.913	1.827	67.662	
18	0.871	1.742	69.404	
19	0.846	1.692	71.096	
20	0.806	1.612	72.708	
21	0.745	1.491	74.199	
22	0.722	1.444	75.642	
23	0.687	1.374	77.016	
24	0.682	1.364	78.381	
25	0.666	1.333	79.714	
26	0.617	1.235	80.948	
27	0.598	1.196	82.144	
28	0.583	1.166	83.31	
29	0.554	1.108	84.418	
30	0.518	1.036	85.454	

<b>31</b>	0.516	1.031	86.485	
<b>32</b>	0.503	1.005	87.491	
<b>33</b>	0.48	0.961	88.452	
<b>34</b>	0.466	0.933	89.384	
<b>35</b>	0.439	0.878	90.262	
<b>36</b>	0.432	0.864	91.126	
<b>37</b>	0.418	0.836	91.962	
<b>38</b>	0.411	0.822	92.784	
<b>39</b>	0.402	0.803	93.587	
<b>40</b>	0.385	0.77	94.357	
<b>41</b>	0.351	0.701	95.058	
<b>42</b>	0.342	0.684	95.742	
<b>43</b>	0.336	0.672	96.413	
<b>44</b>	0.329	0.657	97.071	
<b>45</b>	0.299	0.598	97.669	
<b>46</b>	0.284	0.568	98.236	
<b>47</b>	0.278	0.555	98.791	
<b>48</b>	0.238	0.475	99.267	
<b>49</b>	0.226	0.452	99.719	
<b>50</b>	0.141	0.281	100	
Extraction Method: Principal Component Analysis				

When employing Kaiser's criterion, factors with eigenvalues of 1.0 or more should be retained for further investigation. The eigenvalue of a factor represents the amount of the total variance explained by that factor. Thus, when viewing the 'Total' variance explained in the table, it is evident that there are five components which explain most of the variance with eigenvalues exceeding 1.0. These components explain 17.49%, 9.85%, 4.86%, 4.57% and 3.57% of the variance respectively. Kaiser's criterion has been criticised as resulting in the retention of too many factors and therefore other criterion methods should also be explored.

Another approach that can be used is Cattell's scree test (Cattell, 1966:np, in Pallant, 2005:176). This test involves plotting each of the eigenvalues of the

factors and inspecting the plot to find a point at which the shape of the curve changes direction and becomes horizontal. Cattell (1966:np, in Pallant, 2005:176), recommends retaining all factors above the elbow, or break in the plot, as these factors contribute the most to the explanation of the variance in the data set. Figure 5.1 depicts the scree plot obtained from the data analysis.



**Figure 5.1: Scree Plot**

As evident from the scree plot, there are five components before the point at which the shape of the curve changes. This confirms that the results obtained from Kaiser’s criterion are correct. Thus, it can be said with confidence that the Life-Style Questionnaire’s consists of five factors.

The third step in the FA involves *factor rotation and interpretation*. After determining the number of factors to retain, it must be interpreted. The factors are rotated to assist with this process. The direct oblimin approach to factor rotation was conducted in this study. It is important to note that this does not change the underlying solution, but rather presents the pattern of loadings in a manner that is easier to interpret. Table 5.6 presents the Pattern Matrix of the results obtained from the sample.

**Table 5.6: Pattern Matrix**

	Component				
	1	2	3	4	5
Item 14	0.693	0.002	-0.043	0.006	-0.013
Item 46	0.644	0.404	0.037	0.026	-0.168
Item 4	0.627	0.225	0.048	-0.006	-0.067
Item 34	0.616	0.283	0.013	-0.077	-0.002
Item 49	0.59	0.15	-0.068	0.009	0.131
Item 40	0.562	0.143	0.041	-0.165	0.147
Item 44	0.561	0.046	0.016	-0.055	0.122
Item 21	0.548	-0.147	0.094	0.226	-0.105
Item 24	0.539	-0.207	-0.142	0.105	0.107
Item 31	0.497	-0.234	0.244	0.228	0.054
Item 39	0.45	-0.342	0.345	0.12	0.053
Item 29	0.442	-0.229	0.335	-0.004	0.179
Item 6	0.411	-0.156	0.373	-0.021	-0.021
Item 26	0.338	0.079	0.252	-0.222	0.321
Item 18	-0.124	0.656	0.074	0.273	-0.178
Item 48	0.063	0.636	0.095	0.037	0.01
Item 37	0.013	0.583	0.203	0.245	-0.154
Item 17	0.077	0.577	-0.074	-0.052	-0.06
Item 23	0.063	0.549	-0.227	-0.082	0.107
Item 33	-0.007	0.536	0.088	-0.024	0.025
Item 28	-0.041	0.447	-0.093	-0.028	0.024
Item 12	-0.252	-0.426	0.131	-0.109	0.059
Item 13	-0.339	0.39	-0.218	-0.042	0.358
Item 47	-0.331	0.376	0.083	0.341	0.304
Item 3	-0.117	-0.35	-0.038	0.027	-0.173
Item 35	0.143	0.433	0.554	-0.072	0.174
Item 36	0.176	0.468	0.534	-0.08	0.107
Item 16	0.162	0.281	0.512	-0.047	0.231
Item 5	-0.049	-0.017	0.486	0.069	0.006
Item 41	0.392	0.148	0.465	0.031	0.104
Item 1	0.194	-0.106	0.464	-0.015	-0.012
Item 10	0.057	-0.031	0.456	0.398	0.114

Item 11	0.37	-0.002	0.453	0.116	0.106
Item 32	0.147	0.14	-0.451	0.01	0.141
Item 30	-0.103	0.161	0.413	-0.069	0.304
Item 50	-0.122	0.305	0.394	-0.064	0.37
Item 22	0.029	0.335	-0.386	0.035	0.282
Item 42	0.056	-0.024	-0.122	0.634	-0.092
Item 7	-0.329	0.16	0.023	0.569	0.189
Item 43	-0.033	0.08	-0.018	0.504	0
Item 27	0.207	-0.078	0.015	0.401	-0.06
Item 2	0.128	0.144	0.167	0.38	0.152
Item 45	-0.073	0.03	0.185	0.078	0.633
Item 15	-0.044	-0.198	0.03	0	0.626
Item 38	0.24	-0.043	-0.139	0.048	0.493
Item 25	0.145	-0.027	0.02	-0.359	0.486
Item 8	0.169	-0.178	0.362	-0.279	-0.445
Item 20	0.194	0.109	0.341	-0.156	0.433
Item 9	0.112	-0.055	0.003	0.301	0.322
Item 19	0.253	-0.002	0.14	0.147	0.284
Extraction Method: Principal Component Analysis					
Rotation Method: Oblimin with Kaiser Normalization					

Table 5.7 presents the Structure Matrix of the results obtained from the sample.

**Table 5.7: Structure Matrix**

	Component				
	1	2	3	4	5
Item 14	0.68	0.02	0.138	0.039	0.094
Item 46	0.639	0.383	0.173	0.083	0.04
Item 4	0.634	0.226	0.197	0.042	0.096
Item 34	0.623	0.294	0.165	-0.025	0.165
Item 49	0.598	0.2	0.106	0.052	0.253
Item 40	0.592	0.181	0.201	-0.118	0.272
Item 44	0.584	0.087	0.18	-0.017	0.225



Item 31	0.575	-0.196	0.4	0.252	0.126
Item 21	0.563	-0.142	0.236	0.244	-0.027
Item 29	0.553	-0.182	0.484	0.026	0.249
Item 39	0.547	-0.316	0.486	0.138	0.104
Item 24	0.518	-0.156	0.027	0.115	0.127
Item 6	0.501	-0.159	0.481	0.006	0.067
Item 26	0.448	0.144	0.379	-0.173	0.425
Item 48	0.11	0.641	0.101	0.091	0.188
Item 18	-0.101	0.628	0.013	0.31	-0.018
Item 23	0.032	0.575	-0.21	-0.047	0.21
Item 17	0.061	0.563	-0.079	-0.014	0.076
Item 37	0.071	0.56	0.182	0.292	0.029
Item 33	0.034	0.538	0.077	0.019	0.165
Item 13	-0.329	0.467	-0.262	-0.028	0.36
Item 47	-0.232	0.462	0.051	0.367	0.366
Item 28	-0.051	0.451	-0.111	-0.002	0.108
Item 12	-0.225	-0.43	0.078	-0.144	-0.068
Item 22	-0.016	0.414	-0.34	0.052	0.308
Item 3	-0.164	-0.391	-0.087	-0.013	-0.28
Item 35	0.326	0.462	0.606	0.001	0.385
Item 41	0.538	0.177	0.583	0.089	0.277
Item 36	0.343	0.481	0.583	-0.007	0.327
Item 16	0.341	0.327	0.583	0.016	0.403
Item 11	0.513	0.032	0.574	0.162	0.241
Item 1	0.311	-0.115	0.515	0.01	0.066
Item 10	0.216	0.016	0.51	0.426	0.204
Item 5	0.084	-0.023	0.478	0.09	0.072
Item 30	0.057	0.217	0.427	-0.03	0.387
Item 32	0.055	0.188	-0.392	0.011	0.129
Item 42	0.04	0.004	-0.09	0.625	-0.082
Item 7	-0.258	0.236	-0.009	0.572	0.2
Item 43	-0.009	0.115	-0.003	0.507	0.031
Item 2	0.221	0.208	0.241	0.412	0.249
Item 27	0.219	-0.058	0.082	0.405	-0.027
Item 45	0.084	0.18	0.268	0.111	0.661

<b>Item 15</b>	0.061	-0.051	0.121	0.011	0.576
<b>Item 20</b>	0.349	0.199	0.45	-0.104	0.538
<b>Item 38</b>	0.285	0.088	0.005	0.07	0.502
<b>Item 25</b>	0.21	0.067	0.117	-0.333	0.492
<b>Item 50</b>	0.048	0.377	0.409	-0.014	0.482
<b>Item 8</b>	0.173	-0.307	0.327	-0.282	-0.415
<b>Item 19</b>	0.344	0.08	0.259	0.178	0.352
<b>Item 9</b>	0.179	0.047	0.099	0.316	0.339
Extraction Method: Principal Component Analysis					
Rotation Method: Oblimin with Kaiser Normalization					

Table 5.8 presents the Component Correlation Matrix of the results obtained from the sample.

**Table 5.8: Component Correlation Matrix**

<b>Component</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1</b>	1	0.028	0.264	0.052	0.163
<b>2</b>	0.028	1	-0.022	0.071	0.239
<b>3</b>	0.264	-0.022	1	0.05	0.157
<b>4</b>	0.052	0.071	0.05	1	0.04
<b>5</b>	0.163	0.239	0.157	0.04	1
Extraction Method: Principal Component Analysis					
Rotation Method: Oblimin with Kaiser Normalization					

With regard to the Oblimin rotation approach, there are three tables one should consider: the Pattern Matrix, Structure Matrix and the Component Correlation Matrix.

The first table is the Pattern Matrix table, which shows the factor loadings of each of the variables (Pallant, 2005:190). One should look for the highest loading items on each component in order to identify and label the component. The factor loadings will be discussed in the ensuing subsections.

The second table to consider is the Structure Matrix, which provides information about the correlation between variables and factors (Pallant, 2005:190). The results will also be discussed in the ensuing subsections.

Lastly, one should consider the Component Correlation Matrix. This matrix indicates the strength of the relationship between the five factors (Pallant, 2005:190). The information enables one to decide whether it is reasonable to assume that the components are related or not. The following subsection provides a discussion on the results obtained.

### **5.3.1 Final Factor Solution and Loadings, and Scale Description**

The results of the FA with direct oblimin rotation on the 50 items of the Life-Style Questionnaire indicate five dominant factors which explain 40.35% of the variance of the data. From the FA, it is evident that the original items that were intended to measure the five factors, did not measure what they were supposed to measure.

#### **5.3.1.1 Factor 1**

##### ***Factor Solution and Loadings***

The first factor that emerged from the FA indicate a dominant factor with an eigenvalue of 8.745 for the sample. The first factor explains 17.49% of the variance of the data collected.

##### ***Scale description***

From the FA, it is evident that the original items that were intended to measure factor 1, did not measure what they were supposed to measure. When looking at the Pattern and Structure Matrices, it is evident that there are ten items that strongly load on component 1. In these matrices, the highest loadings are highlighted in grey.

The following items are the items that loaded high on factor 1:

- *Item 4:* “I find myself striving for greater freedom and independence.”
- *Item 14:* “I value my independence highly.”
- *Item 21:* “I tackle projects with zest.”
- *Item 24:* “I am my own person.”
- *Item 31:* “I go after what I want in life.”
- *Item 34:* “I will be most satisfied if I am completely free to choose how I want to live.”
- *Item 40:* “I like to do things my way.”
- *Item 44:* “I like to ‘do my own thing’.”
- *Item 46:* “I have a strong need to be in ‘charge’ of myself.”
- *Item 49:* “In deciding how I want to live and act, I am most satisfied if I am completely free to make this decision myself.”

It should be clear that the items underlying this construct attempt to categorise individuals as independent, confident, persistent, idealistic and capable, to name only a few characteristics.

### **5.3.1.2 Factor 2**

#### ***Factor Solution and Loadings***

The FA yields a second factor with an eigenvalue of 4.927. The second factor explains 9.853% of the variance for the data collected.

#### ***Scale description***

From the FA, it is evident that the original items that intended to measure Factor 2, did not measure what they were supposed to measure. When looking at the Pattern and Structure Matrices, it is evident that there are ten items that strongly load on component 2. In these matrices, the highest loadings are highlighted in grey.

The following items are the items that loaded high on factor 2:

- *Item 3:* “I hate to admit defeat to others.”
- *Item 12:* “I resent feeling the need for other people’s approval.”
- *Item 13:* “I give up too easily after failure.”
- *Item 17:* “I struggle hard to overcome my faults.”
- *Item 18:* “I very much want people to like me.”
- *Item 23:* “I brood too much.”
- *Item 28:* “I am afraid to express my anger.”
- *Item 33:* “I try to hide my weaknesses.”
- *Item 37:* “I have survived by constantly being aware of other people’s opinions and what they want from me.”
- *Item 48:* “I try to appear ‘together’.”

The items underlying this construct attempt to categorise individuals as dependable, gentle, sincere, conscientious, honest, earnest and vulnerable, to name only a few.

### **5.3.1.3 Factor 3**

#### ***Factor Solution and Loadings***

The third factor that emerged from the FA indicates a dominant factor with an eigenvalue of 2.43 for the sample. The third factor explains 4.86% of the variance of the data collected.

#### ***Scale description***

From the FA, it is evident that the original items that intended to measure Factor 3, did not measure what they were supposed to measure. When looking at the Pattern and Structure Matrices, it is evident that there are seven items that strongly load on component 3. In these matrices, the highest loadings are highlighted in grey.

The following items are the items that loaded high on factor 3:

- *Item 1:* “I was a childhood leader.”
- *Item 5:* “I take part in social movements.”
- *Item 11:* “I use my wits to move ahead of other people.”
- *Item 16:* “I like to have power and control.”
- *Item 30:* “I got away with a lot as a child.”
- *Item 32:* “When I was growing up, I felt that my presence was often ignored by one or both of my parents.”
- *Item 41:* “I like to be in position of authority.”

The items underlying this construct can be seen as attempting to categorise individuals as confident, potential leaders, enterprising, competitive, persuasive, ambitious, forceful and demanding.

#### **5.3.1.4 Factor 4**

##### ***Factor Solution and Loadings***

The fourth factor that emerged from the FA indicates a dominant factor with an eigenvalue of 2.285 for the sample. The fourth factor explains 4.57% of the variance of the data collected.

##### ***Scale description***

Once again, from the FA, it is evident that the original items that intended to measure Factor 4, did not measure what they were supposed to measure. When looking at the Pattern and Structure Matrices, it is evident that there are five items that strongly load on component 4. In these matrices, the highest loadings are highlighted in grey.

The following items are the items that loaded high on factor 4:

- *Item 2:* “I believe that my life will be most satisfying if there are some clear pathways for advancing and being rewarded.”
- *Item 7:* “I try to blend in.”

- *Item 27:* “I am unobtrusive.”
- *Item 42:* “I do things right by following the rules.”
- *Item 43:* “I feel that I am a nice person and submissive on the outside.”

The items underlying this construct attempt to categorise individuals as cooperative, social, warm, diligent, serious, obliging, conforming and socially ascendant.

### 5.3.1.5 Factor 5

#### **Factor Solution and Loadings**

The fifth factor that emerged from the FA indicates a dominant factor with an eigenvalue of 1.787 for the sample. The fifth factor explains 3.57% of the variance of the data collected.

#### ***Scale description***

As before, it is clear from the FA that the original items which were intended to measure Factor 5, did not measure what they were supposed to measure. When looking at the Pattern and Structure Matrices, it is evident that there are five items that strongly load on component 5. In these matrices, the highest loadings are highlighted in grey.

The following items are the items that loaded high on factor 5:

- *Item 15:* “People have called me a ‘con artists’.”
- *Item 20:* “I enjoy ‘beating the system’.”
- *Item 25:* “I could join the underground resistance movement.”
- *Item 38:* “I believe that my feelings are nobody’s business but my own.”
- *Item 45:* “Growing up, I began to cut off my compassion for others, because I had to win.”

The items underlying this construct attempt to categorise individuals as persuasive, independent, vigorous, rebellious, protecting, forceful and competitive, to name only a few characteristics.

When looking at the Pattern and Structure Matrices, items 6, 8, 9, 10, 19, 22, 26, 29, 35, 36, 39, 47 and 50 are highlighted in orange. These items imply that there is no indication of which items strongly load on a specific component. In some cases, two or more of the items load on two or more components with a very small difference in value. It can therefore not be said with confidence that these items can differentiate between the five different components and they must thus be deleted from the Questionnaire. When these items are deleted, it is clear that the remaining items load on only one specific component and therefore one can identify and label the component as it has been done above.

After conducting the FA, the reliability of the Life-Style Questionnaire had to be determined. The following section deals with the results obtained for determining the reliability of the Questionnaire.

#### **5.4 RELIABILITY**

As mentioned in Chapter 4, internal consistency was used to determine the reliability of the Life-Style Questionnaire. According to Salkind (2006:112), “internal consistency examines how unified the items are in a test or assessment.” The internal consistency was evaluated by correlating the performance on each of the items in the Life-Style Questionnaire with the total performance of the Questionnaire, which took on the form of a correlation coefficient. The most commonly used statistic to measure internal consistency, is Cronbach’s alpha. “Ideally, the Cronbach alpha coefficient of a scale should be above 0.7” (Pallant, 2005:90). Table 5.9 presents the Cronbach’s alpha for all the variables contained in the Life-Style Questionnaire.



**Table 5.9: Cronbach's Alpha**

Reliability Statistics	
Cronbach's Alpha	N of items
0.82	50

The Cronbach alpha for the Life-Style Questionnaire, based on 50 items and 301 responses, is 0.82, which is high when taking into account that an instrument should have a value of 0.7 to be reliable. It can thus be said that the Life-Style Questionnaire is a reliable instrument of measurement.

## 5.5 ITEM ANALYSIS

An item analysis was conducted to determine which items are inappropriate for use in the instrument. The item analysis was conducted on the Life-Style Questionnaire consisting of five factors. The following subsections describe the results that were obtained for each factor.

### 5.5.1 Factor 1

The ten items measuring factor 1 are: 4, 14, 21, 24, 31, 34, 40, 44, 46 and 49. The Cronbach's alpha for factor 1 is 0.831. The reliability of the scale can be seen as high since, according to Pallant (2005:90), the ideal Cronbach coefficient should be above 0.7.

**Table 5.10: Cronbach's Alpha – Factor 1**

Reliability statistics – Factor 1	
Cronbach's alpha - standardized	N of items
0.831	10

Table 5.11 represents the item statistics for factor 1.

**Table 5.11: Item Statistics – Factor 1**

Variable	Mean	Std. Deviation	N
Item 4	3.3	0.8199	300
Item 14	3.5	0.66695	300
Item 21	3.2567	0.70173	300
Item 24	3.5	0.64658	300
Item 31	3.1033	0.78403	300
Item 34	3.1167	0.87116	300
Item 40	3.2267	0.70018	300
Item 44	3.1967	0.7347	300
Item 46	3.1667	0.83739	300
Item 49	3.1967	0.72092	300

Table 5.12 depicts the item-total statistics for factor 1. By examining the item-total statistics, one can determine which items should be retained or not.

**Table 5.12: Item-total Statistics – Factor 1**

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's alpha if item deleted
Item 4	29.2633	17.88	0.556	0.367	0.812
Item 14	29.0633	18.728	0.56	0.356	0.812
Item 21	29.3067	19.35	0.415	0.275	0.825
Item 24	29.0633	19.712	0.397	0.207	0.826
Item 31	29.46	18.577	0.476	0.322	0.82
Item 34	29.4467	17.492	0.57	0.383	0.81

<b>Item 40</b>	29.3367	18.752	0.522	0.311	0.815
<b>Item 44</b>	29.3667	18.407	0.549	0.342	0.813
<b>Item 46</b>	29.3967	17.544	0.593	0.412	0.808
<b>Item 49</b>	29.3667	18.467	0.552	0.337	0.812

The “Corrected item-total correlation” column indicates the degree to which each item correlates with the total score. The items with values less than 0.3 indicate that they measured something else than what they were supposed to measure and therefore one should consider removing these items. When examining Table 5.12, it is evident that there are no items in this column below 0.3 and therefore no items should be removed. It is also important to examine the last column, namely: “Cronbach’s alpha if item deleted”. When comparing the Cronbach’s alpha of this factor with each of the items’ Cronbach’s alpha entailed in this factor, one needs to determine if there are items with values exceeding the entire factor’s Cronbach alpha. This means that, if there is an item with a value exceeding the factor’s Cronbach alpha, that the factor’s value will increase once that item is deleted. In other words, if there are items that exceed the factor’s Cronbach alpha, one should consider removing those items. Again, there are no items exceeding the value of 0.831 and therefore it can be said that this factor measured what it was supposed to measure.

### **5.5.2 Factor 2**

The ten items measuring factor 2 are: 3, 12, 13, 17, 18, 23, 28, 33, 37 and 48. The Cronbach’s alpha for factor 2 is 0.484. The reliability of the scale can be seen as very low since, according to Pallant (2005:90), the ideal Cronbach coefficient should be above 0.7.

**Table 5.13: Cronbach's Alpha – Factor 2**

Reliability statistics – Factor 2	
Cronbach's alpha - standardized	N of items
0.484	10

Table 5.14 represents the item statistics for factor 2.

**Table 5.14: Item Statistics – Factor 2**

Variable	Mean	Std. Deviation	N
Item 3	2.3289	0.95645	301
Item 12	2.3688	0.95928	301
Item 13	1.9136	0.89023	301
Item 17	2.5681	0.9271	301
Item 18	2.8804	0.95864	301
Item 23	2.6611	0.95818	301
Item 28	2.3821	0.98499	301
Item 33	2.7841	0.92189	301
Item 37	2.5349	0.92535	301
Item 48	2.8904	0.98214	301

Table 5.15 depicts the item-total statistics for factor 2. By examining the item-total statistics, one can determine which items should be retained or not.

**Table 5.15: Item-total Statistics – Factor 2**

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's alpha if item deleted
<b>Item 3</b>	22.9834	17.41	-0.306	0.118	0.605
<b>Item 12</b>	22.9435	18.067	-0.381	0.163	0.624
<b>Item 13</b>	23.3987	12.887	0.345	0.152	0.412
<b>Item 17</b>	22.7442	12.551	0.376	0.249	0.398
<b>Item 18</b>	22.4319	12.14	0.423	0.294	0.379
<b>Item 23</b>	22.6512	12.275	0.401	0.242	0.387
<b>Item 28</b>	22.9302	12.885	0.287	0.157	0.427
<b>Item 33</b>	22.5282	12.963	0.312	0.175	0.421
<b>Item 37</b>	22.7774	12.654	0.36	0.213	0.404
<b>Item 48</b>	22.4219	12.191	0.397	0.273	0.387

The Cronbach alpha for factor 2 is 0.484, which is very low. When examining Table 5.15 and considering the “Corrected item-total correlation” column, there are three values which are less than 0.3. These items are: 3, 12 and 28. One should consider removing these items, as these low values indicate that the items did not measure what they were supposed to measure.

The other important column to examine is the “Cronbach’s alpha if item deleted”. When comparing the Cronbach’s alpha of this factor with each of the items’ Cronbach’s alpha entailed in this factor, one needs to determine if there are items with values exceeding the entire factor’s Cronbach’s alpha. Items 3 and 12 have values exceeding 0.484 and therefore one should consider removing these two items, as deleting these items, the Cronbach’s alpha value will increase.

### 5.5.3 Factor 3

The seven items measuring factor 3 are: 1, 5, 11, 16, 30, 32 and 41. The Cronbach's alpha for factor 3 is 0.545. The reliability of the scale can be seen as low since, according to Pallant (2005:90), the ideal Cronbach coefficient should be above 0.7.

**Table 5.16: Cronbach's Alpha – Factor 3**

Reliability statistics – Factor 3	
Cronbach's alpha - standardized	N of items
0.545	7

Table 5.17 represents the item statistics for factor 3.

**Table 5.17: Item Statistics – Factor 3**

Variable	Mean	Std. Deviation	N
Item 1	2.5867	0.97244	300
Item 5	2.4167	0.99986	300
Item 11	2.7867	0.86621	300
Item 16	2.7867	0.87772	300
Item 30	2.12	0.99443	300
Item 32	2.0067	1.03773	300
Item 41	2.8233	0.90268	300

Table 5.18 depicts the item-total statistics for factor 3. By examining the item-total statistics, one can determine which items should be retained or not.

**Table 5.18: Item-total Statistics – Factor 3**

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's alpha if item deleted
<b>Item 1</b>	14.94	8.966	0.343	0.232	0.477
<b>Item 5</b>	15.11	9.469	0.234	0.104	0.522
<b>Item 11</b>	14.74	8.956	0.425	0.254	0.45
<b>Item 16</b>	14.74	8.441	0.529	0.396	0.407
<b>Item 30</b>	15.4067	9.393	0.251	0.147	0.515
<b>Item 32</b>	15.52	12.264	-0.197	0.056	0.684
<b>Item 41</b>	14.7033	8.403	0.514	0.391	0.41

The Cronbach's alpha for factor 3 is 0.545, which is also very low. When examining Table 5.18 and considering the "Corrected item-total correlation" column, there are also three values which are less than 0.3. These items are: 5, 30 and 32. One should consider removing these items, as these low values indicate that the items did not measure what they were supposed to measure.

The other important column to examine is the "Cronbach's alpha if item deleted". When comparing the Cronbach's alpha of this factor with each of the items' Cronbach's alpha entailed in this factor, one needs to determine if there are items with values exceeding the entire factor's Cronbach's alpha of 0.545. Only Item 32 has a value exceeding 0.545 and therefore one should consider removing this item, as deleting it will increase the Cronbach's alpha value to 0.684.

#### 5.5.4 Factor 4

The five items measuring factor 4 are: 2, 7, 27, 42 and 43. The Cronbach's alpha for factor 4 is 0.51. The reliability of the scale can be seen as low

because, according to Pallant (2005:90), the ideal Cronbach coefficient should be above 0.7.

**Table 5.19: Cronbach's Alpha – Factor 4**

Reliability statistics – Factor 4	
Cronbach's alpha - standardized	N of items
0.51	5

Table 5.20 represents the item statistics for factor 4.

**Table 5.20: Item Statistics – Factor 4**

Variable	Mean	Std. Deviation	N
Item 2	3.1262	0.8025	301
Item 7	2.6379	0.87088	301
Item 27	3.0565	0.7212	301
Item 42	3.2027	0.74975	301
Item 43	3.1296	0.78304	301

Table 5.21 depicts the item-total statistics for factor 4. By examining the item-total statistics one can determine which items should be retained or not.



**Table 5.21: Item-total Statistics – Factor 4**

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's alpha if item deleted
<b>Item 2</b>	12.0266	3.946	0.201	0.052	0.504
<b>Item 7</b>	12.515	3.577	0.271	0.1	0.461
<b>Item 27</b>	12.0963	3.967	0.258	0.13	0.467
<b>Item 42</b>	11.9502	3.754	0.314	0.105	0.433
<b>Item 43</b>	12.0233	3.543	0.364	0.187	0.398

The Cronbach's alpha for factor 4 is 0.51, which is low. When examining Table 5.21 and viewing the "Corrected item-total correlation" column, there are once again three values which are less than 0.3. These items are: 2, 7 and 27. One should consider removing these items, as these low values indicate that the items did not measure what they were supposed to measure.

The other important column to examine is the "Cronbach's alpha if item deleted". When comparing the Cronbach's alpha of this factor with each of the items' Cronbach's alpha entailed in this factor, one needs to determine if there are items with values exceeding the entire factor's Cronbach's alpha of 0.51. There are no items with a value that exceeds the factor's value and therefore it is not necessary to remove any items. Even though the "Corrected item-total correlation" column indicates that there are three items one should consider removing from the Questionnaire, it will not improve its reliability and therefore these items can be retained.

### 5.5.5 Factor 5

The five items measuring factor 5 are: 15, 20, 25, 38 and 45. The Cronbach's alpha for factor 5 is 0.612. The reliability of the scale can be seen as almost

sufficient since, according to Pallant (2005:90), the ideal Cronbach coefficient should be above 0.7.

**Table 5.22: Cronbach's Alpha – Factor 5**

Reliability statistics – Factor 5	
Cronbach's alpha - standardized	N of items
0.612	5

Table 5.23 represents the item statistics for factor 5.

**Table 5.23: Item Statistics – Factor 5**

Variable	Mean	Std. Deviation	N
Item 15	1.2292	0.56916	301
Item 20	2.4419	1.01033	301
Item 25	1.8306	1.01054	301
Item 38	2.6977	0.91194	301
Item 45	1.5615	0.80024	301

Table 5.24 depicts the item-total statistics for factor 5. By examining the item-total statistics, one can determine which items should be retained or not.

**Table 5.24: Item Statistics – Factor 5**

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's alpha if item deleted
<b>Item 2</b>	8.5316	6.223	0.341	0.128	0.58
<b>Item 7</b>	7.3189	4.585	0.442	0.204	0.514
<b>Item 27</b>	7.9302	4.805	0.381	0.159	0.552
<b>Item 42</b>	7.0631	5.373	0.31	0.104	0.587
<b>Item 43</b>	8.1993	5.4	0.397	0.163	0.544

The Cronbach's alpha for factor 5 is 0.612, which is moderately low. When examining Table 5.21 and considering the "Corrected item-total correlation" column, there are no items with a value less than 0.3. Therefore, there are no items that one should consider removing. Thus, this indicates that this factor did indeed measure what it was supposed to measure.

The other important column to examine is the "Cronbach's alpha if item deleted". When comparing the Cronbach's alpha of this factor with each of the items' Cronbach's alpha entailed in this factor, one needs to determine if there are items with values exceeding the entire factor's Cronbach's alpha of 0.612. There are no items with a value that exceeds the factor's value and therefore it is not necessary to remove any items from this factor.

There are nine items which proof to be inappropriate for use in the Life-Style Questionnaire. One should consider removing these items from the Questionnaire, as they will improve the purpose of the Questionnaire.

After determining which items loaded poorly with the FA and deleting the relevant items after the item analysis, it seemed necessary to conduct a confirmatory factor analysis (CFA) on the remaining items. The subsequent section deals with the results obtained from the CFA.

## 5.6 CONFIRMATORY FACTOR ANALYSIS (CFA)

“Harvey *et al.* (1985) proposed that using confirmatory factor analysis (CFA), allows researchers to formulate and directly test competing hypotheses regarding the underlying factor structure” (Buys, Olckers & Schaap, 2007:34). Thus, CFA signifies the actual testing of hypotheses about structures that underlie the responses to each individual item of an instrument.

A CFA was conducted to determine whether the hypothesised theoretical model fits the observed data. The SEM process was used to conduct the CFA. “SEM provides a very general and convenient framework for statistical analysis that includes several traditional multivariate procedures, for example factor analysis, regression analysis, discriminant analysis, and canonical correlation, as special cases” (Hox & Bechger, nd:1). The most important reasons for conducting SEM was, firstly, to hypothesise a set of parameters, including factor loadings, correlations and uniquenesses, and secondly, to determine the fit of the model, in other words, to assess whether the model itself provides a good fit to the data.

All goodness-of-fit measures are some function of the chi-square and the degree of freedom (Hox & Bechger, nd:9). The chi-square test is probably the most common test to measure the goodness-of-fit of an instrument and was determined by using the EQS programme. “The chi-square needs to be 0.05 or smaller to be significant” (Pallant, 2005:290). In other words, the closer the chi-square value is to zero, the more significant the model fit (poor model fit) and vice versa, the further the value is from zero (the closer to 1), the greater the non-significance of model fit (good model fit) exists. Table 5.25 depicts the chi-square results that were obtained.

**Table 5.25: Chi-square Results**

Chi-Square	
Chi-square	2490.424
Probability value for the chi-square statistic	0.0000

The “Probability of the chi-square statistic” is 0.0000, which is smaller than the recommended value of 0.05 and is thus significant. When taking the aforementioned into account, one can conclude that the chi-square indicates a poor model fit.

Because the chi-square test yielded unsatisfactory results, it was necessary to explore other model-fit indices as well in order to determine whether or not there is in fact a poor model fit. Thus, the data was used to create a covariance structure analysis and the Maximum Likelihood (ML) estimation was used to estimate the model’s parameters and fit indices. This estimation method was used because it has been found that the ML estimation produces more accurate fit indices and less biased parameters than generalised least square estimations (Olsson, Foss, Troye & Howell, 2000; Olsson, Troye & Howell, 1999 in Thiagarajan, Chakrabarty and Taylor, 2006).

The maximum likelihood estimation was conducted and the obtained results are represented in Table 5.27. Before ensuing on the representation of the results and a discussion thereof, it is necessary to briefly discuss the requirements for a good model fit.

As mentioned above, it was necessary to explore other fit indices. Garver and Mentzer (1999,np, in Hoe, 2008:76) recommend the following:

- Non-normed fit index (NNFI);
- Comparative fit index (CFI); and
- Root mean square error of approximation (RMSEA).

NNFI is highly recommended as it seems resilient against variations in sample size. An acceptable value for this index is 0.90 or greater (Hoe, 2008:77). “Bentler (1990), developed the CFI as a non-centrality parameter-based index to overcome the limitation of sample size effects” (Hoe, 2008:77). This index ranges from 0 to 1, with a value of 0.90 indicating an acceptable fit. The RMSEA will be discussed separately.

If a model fits the observed data perfectly, the fit indices should have a value of 1. “Usually, a value of at least 0.90 is required to accept a model, while a value of at least 0.95 is required to judge the model fit as ‘good’” (Hox & Bechger, nd:9). Therefore the most important aspect that had to be considered was to see if the values actually meet the necessary requirements. Table 5.26 represents the relevant results that were obtained from the ML estimation.

**Table 5.26: Maximum Likelihood (ML) Estimation**

Fit Indices	
Bentler-Bonett Normed Fit Index	0.618
Bentler-Bonett Non-normed Fit Index	0.756
Comparative Fit Index (CFI)	0.775
Bollen (IFI) Fit Index	0.780
McDonald (MFI) Fit Index	0.485

When looking at the Table 5.26, it is clear that none of the values is larger than 0.90 and it can therefore be said with confidence that a poor model fit exists and that work needs to be done with regard to the Life-Style Questionnaire.

A fairly modern approach to model fit is to accept that models are only approximations and that perfect fit may be too much to ask for (Hox & Bechger, nd:9). Instead, the problem is to assess how well a given model

approximates the true model. According to Hox and Bechger (nd:9), this view led to the development of an index called Root mean square error of approximation (RMSEA). If the approximation is good, the RMSEA should be small. Typically, an RMSEA of smaller than 0.05 is required, and statistical tests or confidence intervals can be computed to test if the RMSEA is significantly larger than this lower bound (Hox & Bechger, nd:9). An RMSEA value of 0.08 indicates a reasonably fitting model. Thus, the closer the RMSEA and Root mean-square residual (RMR) values are to zero, the better the model fit.

**Table 5.27: RMSEA Values**

RMSEA Values	
Root mean-square residual (RMR)	0.059
Standardised RMR	0.082
Root mean-square error of approximation (RMSEA)	0.053
90% Confidence interval of RMSEA	(0.048; 0.058)

From Table 5.27, it is clear that the model fit was, to an extent, satisfactorily. The RMR value is 0.59 and the RMSEA value is 0.053, which is slightly above the recommended value of 0.05, but lower than 0.08 (which indicates a reasonably fitting model). The RMSEA is the only model fit index that indicates a good model fit.

Lastly, the correlations between the five factors are indicated in Figure 5.2. The correlations between the factors are also depicted in Table 5.28.

**Table 5.28: Standardised Estimated Parameters**

	Factor 1	Factor 2	Factor3	Factor 4
Factor 2	0.15			
Factor 3	0.69	0.23		
Factor 4	0.12	0.33	0.12	
Factor 5	0.50	0.24	0.75	-0.00

Low correlations are indicative of factors measuring different constructs, while high correlations indicate that two factors might be measuring the same thing. When looking at Table 5.28, it should be clear that factors 1 and 3; factors 1 and 5; and factors 3 and 5 might be measuring the same constructs, while there is a clear distinction between factors 1 and 2; 1 and 4; 2 and 3; 2 and 4; 2 and 5; 3 and 4; and 4 and 5, since these correlations are low.



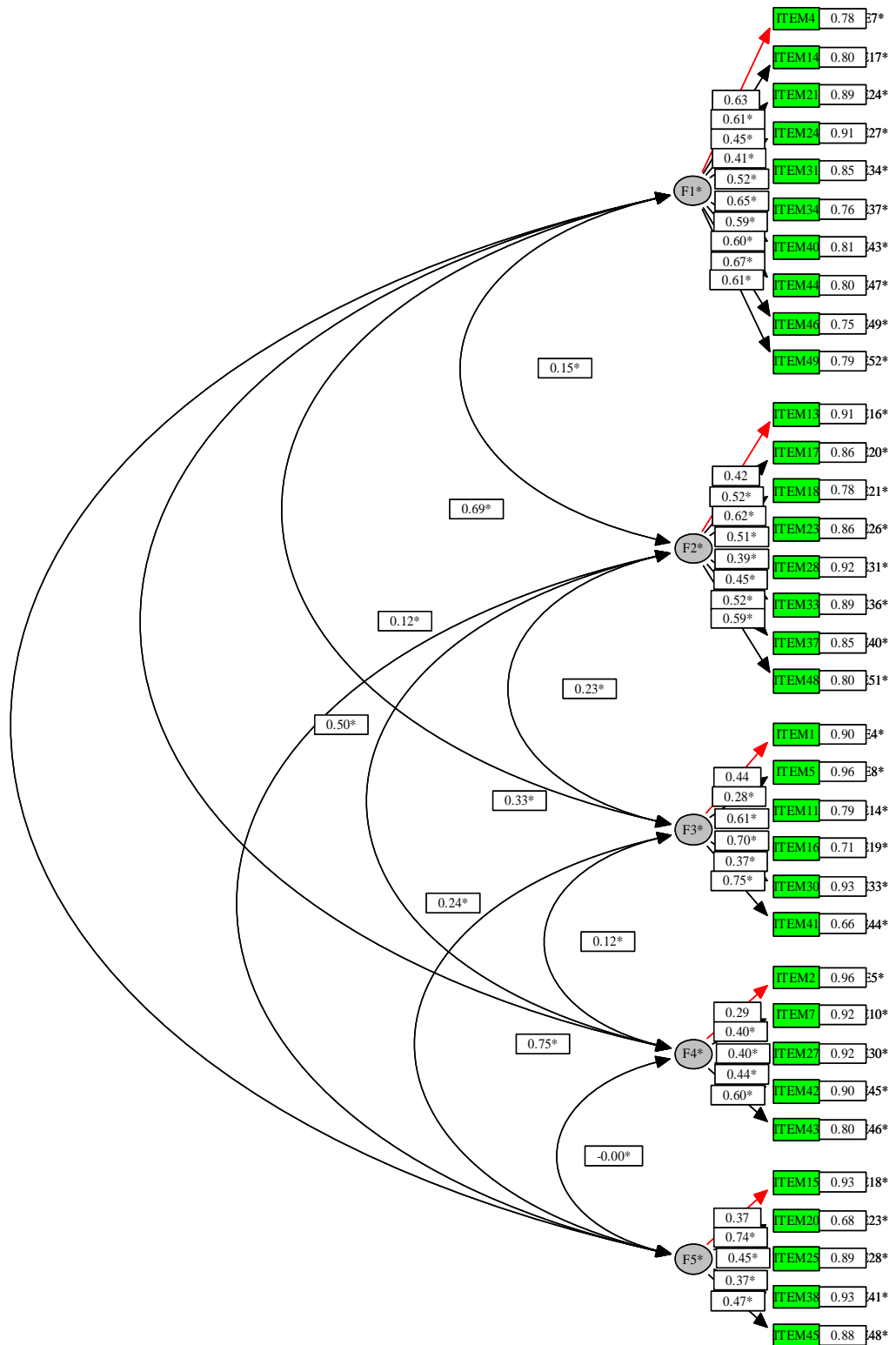


Figure 5.2: Standardised estimated parameters of the Life-Style Questionnaire

## 5.7 SUMMARY AND CONCLUDING REMARKS

The Life-Style Questionnaire was subjected to factor analysis (FA), item analysis and confirmatory factor analysis (CFA) in order to determine the construct validity of the Questionnaire.

Various iterations of the FA indicated the primary factors for each of the components of the Life-Style Questionnaire. The final FA yields a questionnaire consisting of five factors. This was confirmed through Kaiser's eigenvalues and Catell's scree plot.

The item analysis indicates that the removal of items 2, 3, 5, 7, 12, 27, 28, 30 and 32 from the Questionnaire should be considered.

After the factor and item analysis, a CFA was conducted. The purpose of the CFA was to determine whether the postulated theoretical model actually fits the observed data. The most common test to measure the goodness-of-fit of an instrument is the chi-square test. The chi-square test was conducted by using the EQS programme. The results indicate a poor model fit.

Other model fit indices were explored, as the chi-square results were unsatisfactory. All the other fit indices that were examined had to have values exceeding 0.90. In this case, all of these values were less than 0.90. Therefore it is once again proved that a poor model fit exists.

Lastly, a relatively modern approach to model fit was explored. This is called the Root mean square error of approximation (RMSEA). The RMSEA value obtained was 0.053, which is slightly higher than the recommended value of 0.05 and thus indicates a satisfactory model fit. This is the only model fit index that indicates a good model fit and therefore it should be considered carefully.

From all the results obtained, it can be concluded that there is a misfit of the model to the observed data and therefore one should reconsider using this instrument in the South African context.

## CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

### 6.1 INTRODUCTION

The use of psychometric instruments in the South African context is increasing, which requires more research on the psychometric properties of psychological instruments. Construct validity is particularly important to explore, because it determines whether the instrument actually measures what it is supposed to measure. If a measurement is supposed to measure specific constructs and it does not, that instrument must either be withdrawn from the public or it must be amended to provide an instrument that actually measures what it is supposed to measure.

The final chapter of this study aims to outline the conclusions drawn from the study and to make recommendations for future research.

### 6.2 ACHIEVEMENT OF THE STUDY OBJECTIVE

The aim of this study was to determine the construct validity of the Life-Style Questionnaire, developed by Driscoll and Eckstein, in the South African context. The Life-Style Questionnaire was developed as an objective means to measure into which of five trait-descriptive lifestyle categories (*aggressive, conforming, defensive, individualistic, or resistive*) participants belong (Driscoll & Eckstein, 2007:2).

The ability to understand as well as predict human behaviour is one of the main goals of psychology. A very important contribution to the achievement of this goal was Adler's (1930) cohesive concept of personal "lifestyle" (Eckstein & Driscoll, 1998:np). "Adler believed that understanding the human personality involves recognizing that each individual's behaviour has social meaning, is unified and contains definite patterns ("life style"), is based on subjective perception, is purposeful and goal directed, and is motivated by a

desire to overcome feelings of inadequacy coupled with an urge to succeed” (Dinkmeyer, Pew & Dinkmeyer, 1979 in Eckstein & Driscoll, 1998).

Furthermore, construct validity was explored in this study, of which the main aim is to make inferences from the operationalisations in the study to the theoretical constructs on which those operationalisations are based. This was explored in order to determine whether or not the Life-Style Questionnaire (in this case the instrument under discussion) measures what it is intended to measure.

A comprehensive literature review was conducted on an individual's personality, lifestyle, lifestyle in the context of the Life-Style Questionnaire, and on construct validity. While previous research has been conducted on the construct validity (e.g. Green, 1955; Brown, 2000:8-12; Embertson, 2007:449-455) of the Life-Style Questionnaire (Praveen, Samuvel & Naachimuthu, 2007:18-21), little is still known about the construct validity of this specific Questionnaire. All these aspects had to be investigated in order to form a holistic view of what exactly the Life-Style Questionnaire attempted to measure and why.

Taking all the aspects and objectives of this study into account, it was decided that a quantitative survey research was the most appropriate to follow. Data was obtained by distributing the Life-Style Questionnaire to a convenience sample consisting of individuals living in South Africa. A total of 320 responses were obtained for this study with 301 useable responses. The data was obtained and a relevant data analysis was conducted in order to determine the construct validity of the Life-Style Questionnaire. A summary of the findings is discussed below.

### **6.2.1 Data Analysis**

The 301 useable responses were subjected to factor analysis (FA) item analysis, and confirmatory factor analysis (CFA). The reliability of the

questionnaire was also determined. In terms of the biographical information, the majority of the sample consisted of White, Afrikaans-speaking individuals between the ages of 20 and 30.

The SPSS and EQS programmes were used to perform the data analysis. In terms of the reliability of the Questionnaire, a satisfactory alpha coefficient of 0.82 was obtained. When taking into account that an instrument should have a value of 0.7 to be reliable, it is clear that the Life-Style Questionnaire is a reliable measurement instrument. This, however, does not mean that the instrument is valid and therefore further data analysis was necessary.

An FA was conducted. This was done in order to determine the quantity of factors that underlie the set of measurements, and to decide which items measure the same underlying construct. The results of the FA and direct oblimin rotation on the 50 items of the questionnaire indicated five dominant factors that explained 40.34% of the variance of the data. From the FA, it was evident that the original items that were intended to measure the five factors, did in fact not measure what they were supposed to measure.

The Life-Style Questionnaire indicates that the following items measure factor 1 (aggressive trait): items 1, 6, 11, 16, 21, 26, 31, 36, 41 and 46, whereas the FA indicates that the following items actually measure factor 1: items 4, 14, 21, 24, 31, 34, 40, 44, 46 and 49. Factor 2 (conforming trait) is indicated to be measured by items 2, 7, 12, 17, 22, 27, 32, 37, 42 and 47, whereas the FA indicates otherwise with the following items measuring factor 2: items 3, 12, 13, 17, 18, 23, 28, 33, 37 and 48. As with factor 1 and 2, the Life-Style Questionnaire indicates that the following items measure factor 3 (defensive trait): items 3, 8, 13, 18, 23, 28, 33, 38, 43 and 48, but the FA indicates that items 1, 5, 11, 16, 30, 32 and 41 actually measure factor 3. The fourth factor (individualistic trait) is claimed to initially be measured by items 4, 9, 14, 19, 24, 29, 34, 39, 44 and 49, whereas the FA again indicates otherwise with items 2, 7, 27, 42 and 43 measuring factor 4. Lastly, the Life-Style Questionnaire indicates that items 5, 10, 15, 20, 25, 30, 35, 40, 45 and 50

measure factor 5 (resistive trait), while the FA indicates that only items 15, 20, 25, 38 and 45 actually measure factor 5. After this summary, it should be clear that different items than originally stated to measure the factors, actually measure the different factors.

The next step was to conduct an item analysis on the Life-Style Questionnaire. This was conducted to determine which items are inappropriate for use in the instrument. From the item analysis, it is evident that the following items are inappropriate for use and should thus be omitted. These items are 2, 3, 5, 7, 12, 27, 28, 30 and 32.

Lastly, a CFA was conducted. The main reason for this was to determine whether the postulated theoretical model actually fits the observed data. The most common test to measure the goodness-of-fit of an instrument, is the chi-square test. This test was conducted and the results indicate that there is a poor model fit. Other fit indices were therefore also explored. The Maximum Likelihood (ML) estimation was used to estimate the model's parameters and fit indices. Three other main fit indices were explored, namely the NNFI, CFI and RMSEA. The NNFI and CFI should have values exceeding 0.90. "Usually, a value of at least 0.90 is required to accept a model, while a value of at least 0.95 is required to judge the model fit as 'good'"(Hox & Bechger, nd:9). None of these fit indices indicate a value exceeding 0.90 and therefore a model misfit is again proven. With regard to the RMSEA, the value should be small. Typically, an RMSEA of smaller than 0.05 is required, and statistical tests or confidence intervals can be computed to test if the RMSEA is significantly larger than this lower bound (Hox & Bechger, n.d:9). With the RMSEA value being 0.053, which is slightly above the recommended value of 0.05, this test indicates a significant fit. However, because this is the only test that indicates a satisfactory fit, it should be accepted with caution. When considering all the data as a unity, it can be concluded that a poor model fit exists.

Taking the literature as well as the gathered data into account, it can thus be said with confidence that the Life-Style Questionnaire is a reliable, but invalid

measurement instrument. The aim was to determine the construct validity of the Life-Style Questionnaire and the results reveal that the instrument does not measure what it is intended to measure and therefore the questionnaire does not prove to have construct validity. In conclusion, one should reconsider using this instrument in the South African context.

## **6.3 LIMITATIONS OF THE STUDY**

### **6.3.1 General**

A survey research was conducted, which means that the researcher was not present with the completion of the questionnaires. Thus, the respondents did not have the opportunity to ask questions or get clarification from the researcher if they had wished to do so. This could have had an impact on the results, because they might not have understood and interpreted the questions correctly, resulting in responses which could have been different.

### **6.3.2 Data Analysis**

From the data analysis, especially with regard to the CFA, it is evident that there is a poor model fit. The sample could be the reason for this misfit. No literature was found to indicate which type of sample the original Questionnaire was applied to. It might have been applied to a specific age, language, race, or gender group, but there is no evidence thereof. Even though one's personality is established in the early developmental stages of one's life and stays relatively constant throughout an individual's lifetime, some factors such as age, language, race or gender might have had an influence on this study's results. Further research, for example applying the Questionnaire to another type of sample, might confirm or refute the results of this study.



### **6.3.3 Sample**

“No matter how hard a researcher tries, it is impossible to select a sample that perfectly represents the population” (Salkind, 2006:94). The researcher can select the entire population as a sample, but that defeats the purpose of sampling. One way that expresses the lack of fit between a sample and the population is through a sampling error, which is the difference between the characteristics of the sample and the characteristics of the population from which the sample is selected (Salkind, 2006:94). To an extent, the generalisability of a sample to the population is always a problem, because of time and financial reasons.

Even though the sample size was sufficient for the purpose of this study, the generalisability to the whole population is still questionable. The sample consisted of 301 individuals living in South Africa which is an incredible small percentage of the entire South African population. A sample double or triple the current sample size could have resulted in different results.

### **6.3.4 The Life-Style Questionnaire’s Scales**

For the purpose of this study, the items entailed in the Life-Style Questionnaire were rated on a four-point scale. The following are the scales on which the Questionnaire was measured (Driscoll & Eckstein, 2007:5):

- 4 points: True for you always or almost always;
- 3 points: True for you more than half the time;
- 2 points: True for you less than half the time;
- 1 point: Never or almost never true for you.

When considering the scales, one notices that it is not very clearly distinguished. There is not much difference between the different scales, which makes it difficult to choose an answer which truly reflects what you think. This also might have had an influence on the results that were obtained.

One should maybe consider using different scales and then conducting the study again as it might yield more accurate results.

#### **6.4 RECOMMENDATIONS FOR FUTURE RESEARCH**

The study aimed to determine the construct validity of the Life-Style Questionnaire in the South African context. As mentioned above, there are a few factors which might have had an impact on the results. Thus, the following recommendations can be made for future research:

- The wording of the questionnaire should be investigated to ensure that there is no misunderstanding or misinterpretation of the questions, especially when the sample consists of individuals with different home languages.
- The questionnaire should be applied to a specific sample, such as only males, or females, or a specific race group with a specific age.
- A sample size double or even triple this study's size could perhaps yield more accurate results.
- The scales of the questionnaire could be improved and more distinguished.

#### **6.5 CLOSING REMARKS**

From the results of this study, it is important to realise the significance of determining the construct validity of psychological instruments that are freely available to the South African market. A psychological test can either harm or improve many aspects of an individual's life and it is therefore of the utmost importance that a questionnaire, and especially a psychological questionnaire, actually measures what it is intended to measure. All questionnaires that are available to the public, either personally or through the internet, should be investigated to determine their psychometric properties. This study should be an eye-opener for people to realise that every questionnaire does not necessarily measure what it is supposed to measure, and therefore care should be taken when deciding to complete a questionnaire. The results

confirmed that the Life-Style Questionnaire is a reliable, yet invalid questionnaire as it does not measure what it is supposed to measure.

This study should not only emphasise the importance of psychometric properties of psychological instruments, but also the important role that psychometrists and industrial psychologists, together with the Health Professions Council of South Africa (HPCSA), play with regard to the development of psychological instruments and the use thereof.

## LIST OF REFERENCES

- Adcock, A. & Collier, D. 2001. Measurement Validity: A Shared Standard for Qualitative and Quantitative Research. *The American Political Science Review*, 95(3):529-546. [Online] Available from: <http://links.jstor.org/sici=00030554%28200109%2995%3A3%3C529%3AMVASSF%3E2.0.CO%3B2-Y.pdf> [Downloaded: 2010-04-15].
- Anastasi, A. & Urbina, S. 1997. *Psychological Testing*. 7<sup>th</sup> ed. Pearson Education International: Prentice Hall.
- Anderson, C.A. & Bushman, B.J. 2002. Human Aggression. *Department of Psychology*, 53:27-51. [Online] Available from: <http://www.ncbi.nlm.nih.gov/pubmed/11752478.htm> [Accessed: 2010-05-27].
- Bagozzi, R.P. 1993. Assessing Construct Validity in Personality Research: Applications to Measures of Self-Esteem. *Journal of Research in Personality*, 27:49-87. [Online] Available from: <http://deepblue.lib.umich.edu/bitstream/202742/30920/1/0000590.pdf> [Downloaded: 2010-05-18].
- Berardo, F.M., La Greca, A.J. & Berardo, D.H. 1985. *Individual Lifestyles and Survivorship: The Role of Habbits, Attitudes and Nutrition*. [Online] Available from: <http://www.informaworld.com/smpp/content~db=all~content=a78132825> [Downloaded: 2010-06-20].
- Bergh, Z.C. & Theron, A.L. 2003. *Psychology in the Work Context*. 2<sup>nd</sup> ed. South Africa: Oxford University Press.
- Bettencourt, B.A., Talley, A., Benjamin, A.J. & Valentein, J. 2006. Personality and Aggressive Behaviour Under Provoking and Neutral Conditions: A Meta-Analytic Review. *Journal of American Psychological Association*, 132(5):751-777.

Brown, J.D. 2000. What is Construct Validity. Shiken: *JALT Testing & Evaluation SIG Newsletter*, Autumn. [Online] Available from: <http://jalt.org/test/bro8.htm> [Accessed: 2009-04-25].

Buyse, M.A., Olckers, C. & Schaap, P. 2007. The Construct Validity of the Revised Job Diagnostic Survey. *S.Afr.J.Bus.Manage*, 38(2):33-40. [Online] Available from: [http://buyseajdsbusman\\_v38\\_n2\\_a4.pdf](http://buyseajdsbusman_v38_n2_a4.pdf) [Downloaded: 2010-08-16].

ChangingMinds.org. Not dated. *Conformity*. [Online] Available from: <http://changingminds.org/explanations/needs/conformity.htm>. [Accessed: 2010-05-26].

ChangingMinds.org. Not dated. *Conformity*. [Online] Available from: <http://changingminds.org/explanations/theories.htm>. [Accessed: 2010-05-26].

Children's Mercy Hospitals and Clinics. 2006. *What is Construct Validity?*. March. [Online] Available from: <http://www.childrens-ercy.org/stats/weblog/2006/ConstructValidity.asp>. [Accessed: 2009-04-26].

Creswell, J.W. 2009. *Research Design: Qualitative, Quantitative and Mixed Method Approaches*. 3<sup>rd</sup> ed. United States of America: SAGE.

Cronbach, L.J. & Meehl, P.E. 1955. Construct Validity in Psychological Tests. *Psychological Bulletin*, 52:281-302. [Online] Available from: <http://psych-classic.yorku.ca/Cronbach/construct.htm> [Accessed: 2010-07-23].

De Bruin, G.P. & Bernard-Phera, M.J. 2002. Confirmatory Factor Analysis of the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale for South African High School Students. *SA Journal of Industrial Psychology*, 28(2):1-6.

- DiCaprio, N.S. 1974. *Personality Theories: Guides to Living*. Philadelphia, England & Canada: W.B. Saunders Company.
- Driscoll, R. & Eckstein, D.G. 2007. *Life-Style Questionnaire*. Not known.
- Eckstein, D.G. & Driscoll, R. 1998. An Introduction for Lifestyle Assessment. 2<sup>nd</sup> ed. *The Pfeiffer Library*, 3:147-156.
- Embertson, S.E. 2007. Construct Validity: A Universal Validity System or Just Another Test Evaluation Procedure? *Educational Researcher*, 36(8):449-455. [Online] Available from: <http://www.ethiopiaed.net/images/979130525.pdf>. [Downloaded: 2009-06-10].
- Experiment-resources.com. Not dated. *Construct Validity*. [Online] Available from: <http://www.experiment-resources.com/construct-validity.html>. [Accessed: 2010-07-25].
- Foxcroft, C. & Roodt, G. 2005. *An Introduction to Psychological Assessment in the South African Context*. 2<sup>nd</sup> ed. South Africa: Oxford University Press.
- Froman, R.D. 2001. Elements to Consider in Planning and Use of Factor Analysis. *Southern Online Journal of Nursing Research*, 5(2):1-22. [Online] Available from: [www.snrs.org](http://www.snrs.org). [Downloaded: 2010-09-15].
- Hoe, S.L. 2008. Issues and Procedures in Adopting Structural Equation Modeling Technique. *Journal of Applied Quantitative Methods*, 3(1):76-83.
- Hox, J.J. & Bechger, T.M. Not dated. An Introduction to Structural Equation Modeling. *Family Science Review*, 11:354-373.

- Huesmann, L.R., Eron, L.D., Lefkowitz, M.M. & Walder, L.O. 1984. Stability of Aggression over Time and Generations. *American Psychological Association*, 20(6):1120-1134. [Online] Available from: <http://people.stfx.ca/~x2005/x2005eko/Pysch%20260/winter%20paper/CCLS.7.pdf>. [Downloaded: 2010-07-05].
- Hurley, A.E., Scandura, T.A., Schriesheim, C.A., Brannick, M.T., Seers, A., Van den Berg, R.j. & Williams, L.J. 1997. Exploratory and Confirmatory Factor Analysis: Guidelines, Issues and Alternatives. *Journal of Organisational Behaviour*, 18:667-683. [Online] Available from: <http://www.jstor.org/stable/3100253.pdf>. [Downloaded: 2010-11-12].
- Kotze, T.G. 2009. *Research Methodology EBW 801: Theme 6 class notes*. Pretoria: Department of Marketing and Communication Management, University of Pretoria.
- Leedy, P.D. & Ormrod, J.E. 2005. *Practical Research: Planning and Design*. 8th ed. New Jersey: Pearson Prentice Hall.
- Maree, K. 2007. *First Steps in Research*. Pretoria: Van Schaik Publishers.
- Matthews, G., Deary, I.J. & Whiteman, M.C. 2003. *Personality Traits*. 2<sup>nd</sup> ed. United Kingdom: Cambridge University Press.
- Meyer, W., Moore, C. & Viljoen, H. 2003. *Personology: From Individual to Ecosystem*. 3<sup>rd</sup> ed. Sandown: Heineman Publishers.
- Myles, A. 2001. Leadership and Communication Styles. *Learning Unit 3*. October. [Online] Available from: <http://www.tbzmed.ac.ir/MEP/eng/Modules/DLP/LeadershipLearnerGuideLU3.pdf>. [Downloaded: 2010-04-23].
- Orgler, H. 1939. *The Man and His Work: Triumph Over the Inferiority Complex*. London: The C.W. Daniel Company.

- Pallant, J. 2005. *SPSS Survival Manual: A Step by Step Guide to Data Analysis using SPSS*. 2<sup>nd</sup> ed. Open University Press.
- Praveen, K.K., Samuvel, R.J. & Naachimuthu, K.P. 2007. A Study on Trait Descriptive Lifestyles and Teamwork. *Global Management Review*, 1(2):18-22. [Online] Available from: [www.sonamgmt.org/gmr-February-Issue-2007.pdf](http://www.sonamgmt.org/gmr-February-Issue-2007.pdf) [Downloaded: 2009-06-05].
- Rattray, J. & Jones, M.C. 2005. Essential Elements of Questionnaire Design and Development. *Journal of Clinical Nursing*, 16:234-243.
- Salkind, N.J. 2006. *Exploring Research*. 6<sup>th</sup> ed. Pearson Education International: Prentice Hall.
- Saunders, M., Lewis, P. & Thornhill, A. 2007. *Research Methods for Business Students*. 4<sup>th</sup> ed. England: Pearson: Prentice Hall.
- Smith, G.T. 2005. On Construct Validity Issues of Method and Measurement, *American Psychological Association*, 17(4):396-408. [Online] Available from: [http://psych.colorado.edu/~willcutt/res\\_meth/Smith\\_2005.pdf](http://psych.colorado.edu/~willcutt/res_meth/Smith_2005.pdf). [Downloaded: 2010-04-28].
- Socialresearchmethods.net. Not dated. *Construct Validity*. [Online] Available from: <http://www.socialresearchmethods.net/kb/consthre.htm> [Accessed: 2010-07-19].
- Thiagarajan, P., Chakrabarty, S. & Taylor, R.D. 2006. A Confirmatory Factor Analysis of Reilly's Role Overload Scale. *Educational and Psychological Measurement*, 66(4):657-666. Sage Publications. [Online] Available from: <http://epm.sagepub.com/cgi/content/66/4/657.pdf>. [Downloaded: 2010-05-18].



Van den Bergh, R. 2008. *A Comparison Between Managers in South Africa and the Netherlands*. Unpublished Master's Dissertation. University of Pretoria. [Online] Available from UPeTD: <http://upetd.up.ac.za/thesis/available/etd-06032008-102941>. [Accessed: 2010-07-09].

Van Vuuren, M. 2005. *The Construct Equivalence of the PIB/Speex Socialization Index for Job Applicants from Diverse Cultural Backgrounds*. Unpublished Master's Dissertation. University of Pretoria. [Online] Available from UPeTD: <http://upetd.up.ac.za/thesis/available/etd-02272006-111638>. [Accessed: 2010-07-09].

Winter, G. 2000. A Comparative Discussion of the Notion of 'Validity' in Qualitative and Quantitative Research. *The Qualitative Report*, 4. [Online] Available from: <http://www.nova.edu/ssss/QR/QR4-3/winter.html> [Accessed: 2010-06-12].

**APPENDIX A**  
**- Life-Style Questionnaire -**

## LIFE-STYLE QUESTIONNAIRE

Robert Driscoll and Daniel G. Eckstein

Name \_\_\_\_\_

Date \_\_\_\_\_

*Instructions:* Read each of the following statements and assign points according to the following guidelines:

4 points: True for you always or almost always;

3 points: True for you more than half the time;

2 points: True for you less than half the time;

1 point: Never or almost never true for you.

- \_\_\_\_\_ 1. I was a childhood leader.
- \_\_\_\_\_ 2. I believe that my life will be most satisfying if there are some clear pathways for advancing and being rewarded.
- \_\_\_\_\_ 3. I hate to admit defeat to others.
- \_\_\_\_\_ 4. I find myself striving for greater freedom and independence.
- \_\_\_\_\_ 5. I take part in social movements.
- \_\_\_\_\_ 6. I am a "take charge" person.
- \_\_\_\_\_ 7. I try to blend in.
- \_\_\_\_\_ 8. I do not seem to have as much fun as other people have.
- \_\_\_\_\_ 9. As a child I constantly told myself I was special, even though no one else thought so.
- \_\_\_\_\_ 10. I have a great investment in my image.
- \_\_\_\_\_ 11. I use my wits to move ahead of other people.
- \_\_\_\_\_ 12. I resent feeling the need for other people's approval.
- \_\_\_\_\_ 13. I give up too easily after failure.
- \_\_\_\_\_ 14. I value my independence highly.
- \_\_\_\_\_ 15. People have called me a "con artist."
- \_\_\_\_\_ 16. I like to have power and control.
- \_\_\_\_\_ 17. I struggle hard to overcome my faults.
- \_\_\_\_\_ 18. I very much want people to like me.
- \_\_\_\_\_ 19. I take care of myself, and others should take care of themselves.

- \_\_\_\_\_ 20. I enjoy “beating the system.”
- \_\_\_\_\_ 21. I tackle projects with zest.
- \_\_\_\_\_ 22. I sometimes feel depressed and I do not know why.
- \_\_\_\_\_ 23. I brood too much.
- \_\_\_\_\_ 24. I am my own person.
- \_\_\_\_\_ 25. I could join the underground resistance movement.
- \_\_\_\_\_ 26. I am smarter than most people.
- \_\_\_\_\_ 27. I am unobtrusive.
- \_\_\_\_\_ 28. I am afraid to express my anger.
- \_\_\_\_\_ 29. I am a powerful individual.
- \_\_\_\_\_ 30. I got away with a lot as a child.
- \_\_\_\_\_ 31. I go after what I want in life.
- \_\_\_\_\_ 32. When I was growing up, I felt that my presence was often  
ignored by one or both of my parents.
- \_\_\_\_\_ 33. I try to hide my weaknesses.
- \_\_\_\_\_ 34. I will be most satisfied if I am completely free to choose how I  
want to live.
- \_\_\_\_\_ 35. I like to be “one up” on others.
- \_\_\_\_\_ 36. I enjoy being ahead of other people.
- \_\_\_\_\_ 37. I have survived by constantly being aware of other people’s  
opinions and what they want from me.
- \_\_\_\_\_ 38. I believe that my feelings are nobody’s business but my own.
- \_\_\_\_\_ 39. I make things happen.
- \_\_\_\_\_ 40. I like to do things my way.
- \_\_\_\_\_ 41. I like to be in positions of authority.
- \_\_\_\_\_ 42. I do things right by following the rules.
- \_\_\_\_\_ 43. I feel that I am a nice person and submissive on the outside.
- \_\_\_\_\_ 44. I like to “do my own thing.”
- \_\_\_\_\_ 45. Growing up, I began to cut off my compassion for others  
because I had to win.
- \_\_\_\_\_ 46. I have a strong need to be in charge of myself.
- \_\_\_\_\_ 47. I can only have the really important things in life by blending in.
- \_\_\_\_\_ 48. I try to appear “together”.
- \_\_\_\_\_ 49. In deciding how I want to live and act, I am most satisfied if I

am completely free to make this decision myself.

\_\_\_\_\_ 50. I like to be charming just to have my way.