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# Values, Entrepreneurial Attitude, and Entrepreneurial Intentions as Antecedents of Nascent Entrepreneur Business Start-Up Behaviour in South Africa: A Longitudinal Study

by


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# Preliminaries

## Glossary of Select Terms

| Term | Description |
|---|---|
| AGFI | Adjusted Goodness-of-Fit Index (used in assessing model fit) |
| AMOS | The acronym AMOS stands for *Analysis of MOment Structures*. The first version of AMOS was developed by Jim Arbuckle in 1994. AMOS was the first program of its kind to use a graphics file of a path diagram to specify a model and to display parameter estimates on a path diagram. It is fitted with path diagram drawing tools that allow a user to specify a model by creating a graphics file for the path diagram. |
| Bollen-Stine p value | The Bollen-Stine bootstrap p is a bootstrapped modification of the model chi-square statistic used to evaluate model fit. It adjusts for the lack of multivariate normality in the data. |
| Bootstrapping | In a modeling context, statistical bootstrapping is a technique that samples data from within a data set and generates standard errors based on repeated estimates of sample parameters. In AMOS, bootstrapping is selected from the "Analysis Properties" Menu. |
| CFA | Confirmatory Factor Analysis – where the model is specified *a priori* |
| CFI | Comparative Fit Index (used in assessing model fit) |
| Chi-square statistic | The chi-squared test ($\chi^2$) is a statistical test whose results are assessed by reference to the chi-squared distribution. |
| Congeneric Model | In a one-factor congeneric measurement model, all factor loadings and error variances are freely estimated. An underlying assumption is that items contribute in varying amounts to the latent variable (c.f., a parallel model) |
| Construct | A construct refers to a complex psychological concept. |
| Construct Validity | Construct validity is the degree of conformity between a theoretical concept and a particular measuring device or procedure. |
| Convergent Validity | This represents a measure of the extent of the direct structural relationship between an observed variable and a latent construct. Convergent validity is achieved when the correlation (that is, the factor loading) is significantly different from zero. |
| Discriminant Validity | Discriminant validity represents the degree to which the model constructs are dissimilar. Evaluating discriminant validity is important where the constructs are interrelated. Large correlations between the latent constructs (more than 0.80 or 0.90) suggest a lack of discriminant validity. In order to meet discriminant validity requirements, the average variance extracted for two constructs should be greater than the square of the correlation between the constructs. |
| Endogenous Variable | Sometimes referred to as a dependent variable. Endogenous variables are hypothesised to be *caused* by other variables in a model. This is indicated by arrows pointing to an endogenous variable from another variable. The variance of an endogenous variable can never be completely explained by other variables in a model and therefore have an associated error or residual term to represent the effects of unmeasured causes in the model (Cunningham, 2008) (c.f., and exogenous variable) |

| | |
|---|---|
| Exogenous Variable | Sometimes referred to as an independent variable. Exogenous variables have no hypothesised origin in a model and therefore no direct causal arrows point toward them (c.f. an endogenous variable). |
| Formative Latent Variable | A formative latent variable has arrows going from the indicator items to the latent variable (c.f., a reflective latent variable) |
| GFI | Goodness-of-Fit Index (used in assessing model fit) |
| Indigenous | Originating in and characteristic of a particular region or country; native (often followed by the word "*to"*): *... the indigenous peoples of southern Africa*. (From www.dictionary.com … http://dictionary.reference.com/browse/indigenous) |
| Latent Variable | A latent variable represents a variable that cannot be directly observed. It can be loosely interpreted as a "factor". In this thesis, a latent variable represents a theoretical construct about the underlying characteristics of an individual in terms of his/her values and entrepreneurial attitude (Kline, 2005). Because a latent variable cannot be observed directly, it cannot be measured directly; thus it must be operationally defined and measured in terms of behaviour believed to represent the particular latent variable (Byrne, 2001). In terms of a latent variable, the measured scores can be produced in terms of responses to particular questions on a survey. These responses which provide "measured scores" are sometimes referred to as observed variables or indicator items (or items). |
| LISREL | The term, LISREL, is the acronym for an SEM package. LISREL stands for *LInear Structural RELationships*. |
| Nascent entrepreneur | An individual who does not currently own a business and who intends starting a business in the short term (within the next three years) (see, for example, McGee, Peterson, Mueller, and Sequeira, 2009). They also engaged in the following activities which reinforced their nascent entrepreneur status (McGee, Peterson, Mueller, and Sequeira, 2009):<br>• Were attending a "start your own business planning" program (p. 977)<br>• Participated in workshops that included how to write a business plan and were required to write a business plan, and<br>• Actively engaged in "developing a product or service" (p.977).<br>Further, nascent entrepreneurs were designated as those who had participated in at least two of the following six behaviours currently or in the past: (1) attending a "start your own business planning" seminar or conference, (2) writing a business plan or participating in seminars that focus on writing a business plan, (3) putting together a start-up team, (4) looking for a building or equipment for the business, (5) saving money to invest in the business, and (6) developing a product or service. |
| Measurement Error | Measurement error is the extent to which observed values are *not* representative of the "true" values of a variable. An observed variable is assumed to contain the "true" level of what is being measured as well as "noise" (see, also, "reliability"). |
| Mplus | Mplus is a statistical modeling program developed by Linda and Bengt Muthen.. |
| Non-Entrepreneur | An individual who has stated that he/she has no intention of starting a business in the immediate future. |
| Observed Variable | A variable that can be observed directly (and therefore measured directly) such as whether an individual starts a business or not. |
| PASW | Previously called *SPSS – Statistical Package for the Social Sciences*. In 2009, Version 18 of *SPSS* was renamed *PASW Statistics* (PASW stands for *Predictive Analytics Software*). In 2010, *PASW Statistics* was changed again to *IBM SPSS*. |

| | |
|---|---|
| Parallel Model | A parallel model is a model where all the factor loadings are equal and, thus, each item contributes in an equal way to the latent variable. It is also assumed that the measurement error variances are also equal (c.f., a congeneric model). |
| Reflective Latent Variable | A reflective latent variable has arrows going from the indicator items to the latent variable (c.f., a formative latent variable). |
| Reliability | Reliability is the level to which an observed variable measures the "true" value of a variable and the extent to which it is "error free" ("reliability" is the opposite of "measurement error"). It refers to the consistency of measurement and can be conceptualised as that part of a measure that is free of purely random error. In this research, reliability is measured using Cronbach alpha and Coefficient H. Strictly speaking, Cronbach alpha is more appropriate for parallel measurement models. A reliability measure such as Coefficient H is more appropriate for congeneric measurement models. |
| RMSEA | Root Mean-Square Error of Approximation (used in assessing model fit) |
| SEM | Structural Equation Modeling (SEM) is a general name for the statistical analysis of Structural Equation Models. Structural Equation Models are models that identify relationships among sets of variables. These can be identified by means of path diagrams. Structural Equation Modeling adopts a confirmatory approach to analysing a specific structural theory associated with a particular phenomenon (Byrne, 2001). Unlike more traditional statistical data analyses, SEM can incorporate both observed and latent variables in an analysis. |
| SRMR | Standardised Root Mean-square Residual (used in assessing model fit) |
| Structural Theory | "A *structural theory* is a conceptual representation of the relationship between constructs. It can be expressed in terms of a *structural model* that represents the theory with a set of structural equations and is usually depicted with a visual diagram." (Hair, Black, Babin, Anderson, and Tatham, 2005, p. 845) |
| Structural Model | "Structural models are referred to by several terms, including a theoretical model or occasionally a causal model. A *causal model* infers that the relationships meet the conditions necessary for causation. … The structural model applies the structural theory by specifying which constructs are related to each other and the nature of each relationship." (Hair, Black, Babin, Anderson, and Tatham, 2005, p. 845) |
| TLI | Tucker-Lewis Index - somewhat equivalent to the Non-Normed Fit Index (NNFI) (used in assessing model fit). |
| Validity | Validity refers to the accuracy of a measure. It exists when a measure is a perfect representation of the variable being measured. |

# Abstract

Various studies have embarked on identifying differences between existing entrepreneurs and non-entrepreneurs. Many of these studies used personality characteristics and demographics to explore these differences but to no avail. The use of attitude theory, however, has shown promise in predicting behavioural tendency differences between existing and non-entrepreneurs. Various questions, however, remain unanswered including ... Whether entrepreneurial attitudes are inherent in nascent entrepreneurs or whether they develop through exposure to business? To what extent do entrepreneurial attitudes develop over time and how are they related to business start-up? To what extent is it possible to develop entrepreneurial attitudes in non-entrepreneurs? If this is possible, are these attitudes sustainable over time that will lead to business start-up behaviours?

In dealing with these unanswered questions, a potentially problematic issue that has been identified with the attitude construct in the psychological literature is that attitudes may not be stable. Thus, attitude toward an object may change. Validated entrepreneurial attitude scales have been developed and deployed; however, most key studies have been cross-sectional and so have not been able to measure whether temporal changes occur.

This research adopts a repeated measures longitudinal approach to measuring entrepreneurial attitude so as to be able to address this issue. In addition, because values are regarded as a relatively stable construct and because values and attitudes are related, this research also examines the values - entrepreneurial attitude - entrepreneurial intentions relationship over time and examines to what extent these contribute toward business start-up behaviour.

The research design employs two groups: one group whose members identified themselves as intending to start a business (referred to as nascent entrepreneurs) and another group whose members stated that they had no intentions of starting a business (referred to as non-entrepreneurs). These two groups were tracked over a four and a half year period with repeated measures taken at $T_1$ (Baseline), $T_2$ (one year later after they participated in a one year entrepreneurship training and mentoring intervention), and at $T_3$ (end-of-study) – which was three and a half years after $T_2$. There were 329 nascent and 107 non-entrepreneurs at $T_1$ and 287 nascent and 106 non-entrepreneurs participating in the research at $T_3$.

All participants were black South Africans, chronically unemployed, and were socially and economically disadvantaged. Thus, a major motivation for starting a business for the nascent entrepreneur group was out of necessity – they needed to generate a revenue stream to improve their quality of life and/or survive.

Using structural equation modeling, both differences and similarities were detected over time between the nascent entrepreneur and non-entrepreneur group results. Entrepreneurial attitudes and intentions fluctuated while values remained relatively stable. Because attitudes are unstable, the use of entrepreneurial attitudes alone to differentiate between the nascent and non-entrepreneur groups would have been effective at $T_1$ and $T_3$ but would have produced spurious results at $T_2$.

The research contributes to theory by building upon and extending prior research that has mainly been undertaken in a Westernised context so that there is a better understanding of the research constructs and their inter-relationships in a socio-economic disadvantaged context within a developing country,. The research also contributes toward practice in terms of the insights gleaned from the behavioural outcomes identified from immersing nascent and non-entrepreneurs in an intensive entrepreneurship training and mentoring program intervention.

# Thesis Declaration

I, Wendy Lindsay, certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library catalogue and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

________________________________26 July, 2012

**Wendy A. Lindsay**

# Acknowledgements

My parents bore five children across three African countries. From an early age both parents instilled in us a sense of adventure, self-belief, and independence. I was taught that anything is possible if you believe in yourself sufficiently and maintain focus through to fulfilment. My sister and three brothers can also claim a share in reinforcing this adventurous and committed spirit in me. I have the fondest memories of family road trips to various Southern African locations to experience and observe the wildlife at first hand, instilling in me a lifelong appreciation for nature. Contrasting these vacations with trips to Europe provided a stark disparity when comparing European and Southern African culture, customs, and the extremes in wealth and poverty observed. These experiences provided a context to implant a sense of enquiry within me that generated the motivations behind the research questions addressed in this research.

It was these cherished, childhood experiences and influences that played a significant role in shaping my character and guiding the chosen paths of my life. These foundations have been catalytic in providing the dream and drive for completing my PhD. Of course, others have provided substance and counsel along the way. Professor Fredric Kropp and Professor Vernon Ireland, my supervisors, are two such people. I thank them for sharing their eclectic perspectives which enhanced my appreciation that there are multiple perspectives on how to view the world – none of which alone can be thought of as "the" way. In mentioning supervisors, I would also like to make a special reference to the late Dr Dennis List, my initial supervisor who commenced the doctoral journey with me, but sadly was unable to see me cross the finish line.

Thanks also go to the "PhD team" at the ECIC; specifically Dr Barry Elsey, who provided strong motivation and support through playing "Devil's Advocate" with his critical questioning, but equally constructive feedback.

In thanking my family, sincere gratitude goes to my husband, Noel, for propelling and supporting me through the emotive highs and the lows of this ride. His continual moral and technical support, as well as critical and constructive eye on my writing, has been invaluable in reaching this milestone. Finally, to my daughter, Teegan, just turned 10 years old, who went without her Mum on many an occasion so I could give due focus to my thesis; I owe you … and you will probably never let me forget!! I hope you forgive me that "lost" time and that my doctoral journey may inspire you to follow your own journeys of discovery through life.

**Wendy A. Lindsay**
26 July, 2012

# Values, Entrepreneurial Attitude, and Entrepreneurial Intentions as Antecedents of Nascent Entrepreneur Business Start-Up Behaviour in South Africa: A Longitudinal Study

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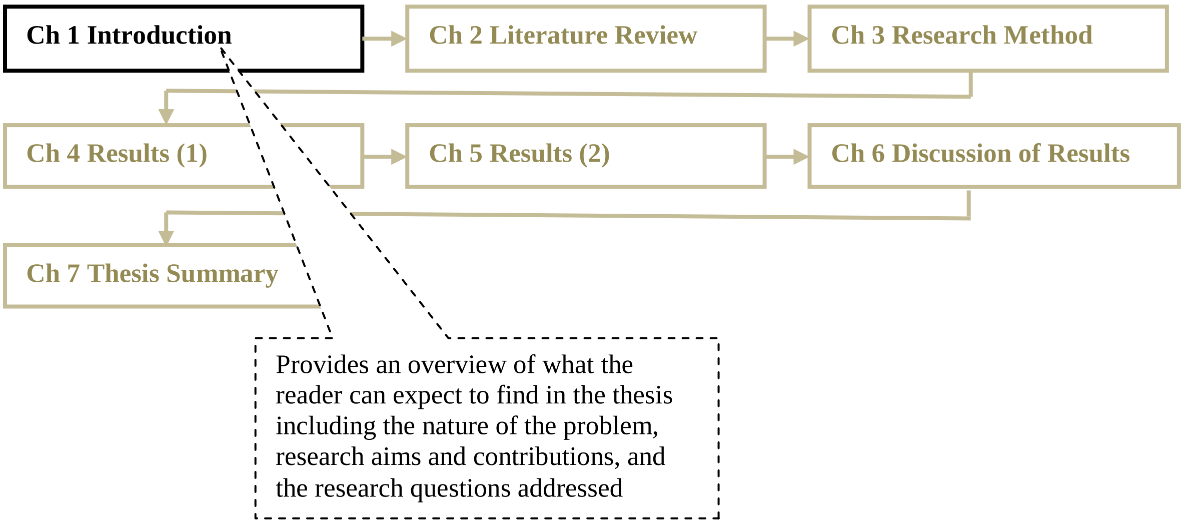
# Chapter 1
# Introduction




## 1.0 Introduction

Chapter 1 provides an overview of the thesis. It states the nature of the problem and provides an overview of the contents of the various Chapters. It identifies the research aims, research motivations, research importance, and the contributions the research makes at the theoretical and practical levels.

The focus of the research is on four individual level analysis variables and their inter-relationships - personal values, entrepreneurial attitude, entrepreneurial intentions to start a business, and business start-up behaviour. A conceptual model is developed that contains these variables and is examined using two groups of individuals: Those who have intentions to start a business (referred to as the “nascent entrepreneur group”) and those who have no such intentions (referred to as the “non-entrepreneur group”). Both groups participated in a comprehensive one-year entrepreneurship training and mentoring program. For each participant, three sets of repeated measures concerning the variables of interest were observed over a 4.5 year period – the duration of the research project. Participant measurements were taken immediately prior to the training and mentoring intervention program commencing (referred to as $T_1$ or Baseline), immediately after the one year training and mentoring program finished (referred to as $T_2$), and then three and a half years after the training and mentoring program completed – which was 4.5 years after the study started (referred to as $T_3$ or end-of-study).

The research took place, and the data for the project was collected, in Johannesburg, South Africa. All participants were classified as socially and economically disadvantaged[1] by the South African Government. Participants were black South Africans, living in surrounding townships, who did not have jobs, and who faced economic hardship. Many had not had a job for a number of years. Both groups of participants needed to generate an income to improve their quality of life and/or survive. Out of necessity, members of the nascent entrepreneur group wanted to improve their financial position by establishing businesses. Members of this group participated in the entrepreneurship training and mentoring intervention program so that they could learn about how to establish and develop businesses. Members of the non-entrepreneur group wanted to generate an income by getting a job; however, they saw value in participating in the entrepreneurship training and mentoring program as a means of enhancing their employment prospects by hoping to be perceived as being enterprising by prospective employers. As such, they participated in the training and mentoring program as well.

## 2.0 Why South Africa?

South Africa, a developing country, was chosen as the context for this research for several reasons:

(1) *Familiarity with South Africa*: From a personal perspective, South Africa is the birthplace of the author of this thesis. I called South Africa home for many years – living there, working there, and then establishing and developing three successful businesses there. I therefore continue to have a great affinity with South Africa (even though Australia is my home now) and this affinity is fuelled by my ongoing return visits to see family and friends who still live there. As such, I believe that I have a reasonable understanding of South African culture(s) which enhances my ability to undertake this research in that country (my undertaking a similar research project in another developing country such as India, Pakistan, or East Timor would have been much more difficult for me as I am not familiar with either the cultural norms or customs in these countries and

[1] For insights into the term, the US. Government defines "socially and economically disadvantaged" individuals under its Small Business Act (15 USC 637) … (5) *Socially disadvantaged individuals* are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities. (6)(A) *Economically disadvantaged individuals* are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged. In determining the degree of diminished credit and capital opportunities the Administration shall consider, but not be limited to, the assets and net worth of such socially disadvantaged individual.

there also would have been potential language barriers). Having said this, I am interested in developing countries/emerging nations generally and so I use South Africa as a case study whereby what I learn from South Africa may have some relevance in understanding entrepreneurship as it applies in other developing countries.

(2) *Enhanced future training possibilities*: There is an ongoing need to deliver appropriate entrepreneurship training and mentoring programs in South Africa to those who will benefit most – particularly to those in disadvantaged communities – who need to establish businesses out of necessity since there is little in the way of employment opportunities. Although evaluation of the entrepreneurship and training program that formed the intervention in this research was beyond the scope of this research, being able to measure participants on key psychological variables before, during, and after they engaged in the training process provided insights that may be useful for participant recruitment on such programs in the future.

(3) *Not enough entrepreneurship research on developing countries*: There are few employment opportunities in the black socially and economically disadvantaged communities of South Africa. As such, there is an ever increasing need to encourage entrepreneurial activity in these communities. Thus, research that leads to improving our understanding of entrepreneurship in South Africa has value; however, most behavioural science research that is published in the top tier journals occurs within a context of *Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies* (Henrich, Heine, and Norenzayan, 2010).

In a recent survey of the top tier psychology journals, 96% of the subjects in those studies were from the USA and Europe (which represented countries with only 12% of the world's population) with most of the subjects being students (Henrich, Heine, and Norenzayan, 2010). Henrich, Heine, and Norenzayan (2010) state that there is nothing wrong with this, per se, except that often behavioural scientists attempt to generalise beyond the sample they have taken without considering consciously "… how well results from WEIRD samples generalize to the species … (and that this) … lack of epistemic vigilance underscores the prevalent, though implicit, assumption that the findings one derives from a particular sample will generalize broadly; one adult human sample is pretty much the same as the next" (p. 63). Yet, it seems that WEIRD subjects are atypical compared to the rest of the global population - representing outliers in many instances ... In fact, WEIRD subjects are the least representative for generalising to the human species (Henrich, Heine, and Norenzayan (2010).

Although the author of this research is not aware of the exact proportion of *entrepreneurship research* that occurs in a WEIRD context, an examination of the top tier entrepreneurship journals over the last 10 years reflects a predominantly Westernised orientation with the use of student subjects in a number of entrepreneurship studies. Thus, at a broad level, an underlying motivation for the South African context in this research is that South Africa is unlike many Western societies and entrepreneurship in this context needs to be better understood. Granted, there are strong elements of the West present in aspects of South African society and the trappings of Western societies are present or are aspired to by many – particularly in the major cities; yet, for many black South African people, aspects of tribal customs and culture may still impinge their “Westerness” in the cities and these are stronger in the smaller towns and communities – particularly in the rural areas. Thus, the WEIRD results reflected in top tier entrepreneurship journals may not necessarily be generalisable to how entrepreneurship is performed in South Africa (or at least in some South African communities). For this reason, examining entrepreneurship in a black socially and economically disadvantaged South African context is considered to be a relevant and worthy research task. Ultimately, I would like to think that my research may help to contribute toward a better understanding of entrepreneurship in South Africa particularly for those who live in disadvantaged communities.

## 3.0 Theoretical Foundations and Research Questions

The research is founded upon Ajzen’s (1991) theory of planned behaviour. Underpinning this theory is the notion that, “Intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control; and these intentions, together with perceptions of behavioural control, account for considerable variance in actual behaviour” (Ajzen, 1991, p. 179).

Central to this research are the following individual *research questions*:

1. To what extent are personal values related to entrepreneurial attitude?
2. To what extent is entrepreneurial attitude related to entrepreneurial intention?
3. To what extent is entrepreneurial attitude related to business start-up behaviour?

4. To what extent are personal values related to business start-up behaviour?
5. To what extent are values stable over time?
6. To what extent is entrepreneurial attitude stable over time?
7. To what extent is entrepreneurial intention stable over time?
8. Do nascent entrepreneurs start with an entrepreneurial attitude when they are nascent or is an entrepreneurial attitude developed once they become entrepreneurs?
9. Are there differences in the entrepreneurial attitude of nascent and non-entrepreneurs?
10. Are there differences in the personal values of nascent and non-entrepreneurs?
11. To what extent do personal values, entrepreneurial attitude, entrepreneurial intention, and business start-up behaviour differ between the nascent entrepreneur and non-entrepreneur groups?
12. To what extent do the inter-relationships among personal values, entrepreneurial attitude, entrepreneurial intention, and business start-up behaviour differ between the nascent entrepreneur and non-entrepreneur groups (that is, to what extent does group membership act as a moderating variable)?

## 4.0 Nature of the Problem

Various researchers have attempted to distinguish entrepreneurs from non-entrepreneurs. The two most common approaches (Robinson, Stimpson, Heufner, and Hunt, 1991) were based on personality theory and demographic characteristics (e.g., McClelland, 1961; McClelland, Atkinson, Clark, and Lowell, 1953; Brockhaus, 1975; Brockhaus and Horwitz, 1986). Although the results of these studies appeared promising, they produced a range of conflicting results that eventually received criticism because it was argued that this form of research did not help in extending our understanding of entrepreneurs (see, for example, Gartner, 1988). These inconsistencies, however, did not impede other scholars from attempting to differentiate entrepreneurs from non entrepreneurs based on their attitudes. Robinson, Stimpson, Heufner, and Hunt (1991) and McCline, Bhat, and Baj (2000), for example, found that entrepreneurs exhibit entrepreneurial attitudes that are different from those exhibited by non-entrepreneurs. However, what they could not answer in their research was whether *nascent* entrepreneurs demonstrated an entrepreneurial attitude from inception; that is, do entrepreneurs have an entrepreneurial attitude prior to becoming entrepreneurs? This research builds upon the work of Robinson, Stimpson, Heufner, & Hunt (1991) and McCline, Bhat, & Baj (2000) and attempts to answer this question by examining nascent entrepreneurs over time as they transition to becoming entrepreneurs.

In addition to examining attitude, this research also examines values since there is support for a values – attitude relationship (in particular, this research examines the values –

*entrepreneurial* attitude relationship as it pertains to opportunity recognition since there is a nexus between entrepreneurs and opportunities (Eckhardt and Shane, 2003; Shane and Venkataraman, 2000; Venkataraman, 1997)).

As higher order social cognitions, values play a central role in shaping attitudes. For example, Homer and Kahle (1988) identified significant relationships among values, attitudes, and behaviours … values influence attitudes which, in turn, influence intentions and, ultimately, behaviour (Ajzen, 1982, 1985; Fishbein and Ajzen, 1975). Thus, the values – business start-up behaviour relationship is also examined in this research.

This research therefore builds upon previous studies by focusing on the inter-relationships among the variables of interest - values, entrepreneurial attitudes, entrepreneurial intentions, and business start-up behaviour. Prior entrepreneurship studies have not examined the values - entrepreneurial attitude relationship and there is a paucity of studies that has examined the entrepreneurial attitude - business start-up behaviour relationship; yet, it is well established that attitude is related to behaviour (Ajzen, 1991). To be able to understand the transitioning process of the nascent entrepreneur moving from the intention to establish a business through to the act of business start-up and the dynamic nature of the constructs and their inter-relationships, a repeated measures longitudinal study is adopted to answer the research questions.

## 5.0 Research Aims, Importance, Motivations, and Contributions

The *over-arching aim of this research* is to better understand to what extent do values, entrepreneurial attitude, and entrepreneurial intention contribute toward business start-up behaviour in a socially and economically disadvantaged South African context. Answering this question will lead to an understanding of the nature of, and inter-relationships among, the relevant variables in this research as they pertain to black South African socially and economically disadvantaged nascent entrepreneurs. Of particular interest is to what extent values, entrepreneurial attitude, and entrepreneurial intentions influence business start-up behaviour as nascent entrepreneurs transition from having entrepreneurial intentions to starting their businesses.

The *importance of this research* is underpinned by the mounting evidence of the link between entrepreneurship and economic development (Acs and Virgill, 2010a). In developing countries, such as South Africa, entrepreneurial activity is particularly essential because it fills in important gaps in imperfect markets (Leff, 1979).

Most countries in the world are classified as developing countries. For example, there are approximately 160 developing countries listed by the International Monetary Fund (2011) out of the 192 plus countries in the world (there are 192 member countries of the United Nations but this list does not include, for example, countries such as Kosovo, Palestine, or The Vatican). In many developing countries, there is high unemployment, poor health, poor education standards, inequality, a prevalence of crime, and/or social unrest. Thus, undertaking research in a developing country(s) that helps to improve our understanding of entrepreneurship in that country is important because entrepreneurship may be a way of helping to solve some of the economic ailments in that country through stimulating economic development.

*Motivation for this research* stems from the fact that there is an imperative for better understanding how entrepreneurship works in a developing country such as South Africa and whether it is different than what occurs in developed countries. As previously mentioned, the majority of prior entrepreneurship studies have occurred in a developed country context. This research attempts to contribute toward filling gaps in the literature that exist in so far as they relate to a developing country context … where necessity entrepreneurship – as distinct from opportunity-focused entrepreneurship – is the predominant form of entrepreneurship. Necessity entrepreneurship is somewhat akin to survivalist entrepreneurship which has been associated with studies into the concept of survival for necessity immigrant entrepreneurs (see, for example, Kalnins and Chung, 2006; Berner, Gomez, and Knorringa 2012; Chrysostome, 2010) though the term, “survival”, has also been associated with Indigenous necessity entrepreneurs (see, for example, Maritz, 2004).

The broad *contributions of the research* can be viewed at the theoretical and applied levels. At a *theoretical level*, the research contributes toward a better understanding of the importance and inter-relationships among the constructs over time. This is achieved by examining the construct inter-relationships via a longitudinal growth model that provides insights into the dynamic nature of the constructs and their inter-relationships. Many prior studies have used cross-sectional designs that make it difficult to allow the researcher to understand how the constructs can change over time. At an *applied level*, the research makes a contribution toward the framing and development of government policy related to the encouragement of start-up behaviour. It also has implications for the design, development, and delivery of training programs aimed at facilitating entrepreneurial start-up behaviour.

## 6.0 Thesis Overview

The thesis is structured into seven Chapters, a Reference section, and five Appendices.

*Chapter 1 Introduction* (this Chapter) provides an overview of the research including the aims, importance, and motivations of the research as well as the structure of the thesis.

*Chapter 2 Model Development* identifies the conceptual model including the model variables, their inter-relationships, and underlying hypotheses. The conceptual model does not exist in a vacuum and so the research environment – South Africa – is discussed to provide a context for the research. This context involves a discussion about motivational differences between entrepreneurs that start businesses because they want to and those that do so because they have to – because of their economic circumstances. Since the research design incorporates a training intervention, Chapter 2 also discusses theoretical and pedagogical issues associated with entrepreneurship training.

*Chapter 3 Research Method* provides the basis for understanding the research method used in the research. It discusses the research design and its longitudinal nature, the profile of those who participated in the study and how they were recruited, the construct measures used in the research, and insights into the statistical analyses undertaken.

*Chapter 4 Results (1)* describes the results of the analyses undertaken up to developing the full structural model. The results of t-tests and confirmatory factor analyses associated with the one factor congeneric measurement models and the combined measurement models are presented. The Chapter also discusses the lack of multivariate normality in the data and presents the results of a series of invariance tests to determine if both the nascent and non-entrepreneur groups were from the same population and interpreted the survey questionnaire in a similar manner.

*Chapter 5 Results (2)* presents the repeated measures' results of the full structural model analyses including consideration as to whether a composite model should be used. A decision was made not to use the composite model developed. Tests of the group moderating variable hypotheses are also undertaken in this Chapter.

*Chapter 6 Discussion of Results* attempts to interpret what the results mean. Since many prior values and entrepreneurial attitude studies have been largely cross-sectional in nature, this Chapter identifies the benefits of engaging in a repeated measures longitudinal study.

*Chapter 7 Thesis Summary* presents a précis of the thesis, identifies the limitations associated with the research, and provides suggestions for how future studies could build upon this research to overcome some of its inherent limitations as well as provide suggestions for future research directions. The research contributions are also revisited in this Chapter.

Following these Chapters and References section, five Appendices provide supporting content for some of the Chapters.

## 7.0 Chapter Summary

Chapter 1 is designed to orient the reader to the research undertaken. It provides a general overview of, and introduction to, the research that focuses on the inter-relationships among personal values, entrepreneurial attitudes, and entrepreneurial intentions of nascent entrepreneurs as antecedents of business start-up behaviour. The Chapter identifies the research aims, research importance, research questions addressed in the research, and research contributions to theory development and policy and practice. It also provides insights into the contents of the seven Chapters that comprise the thesis.

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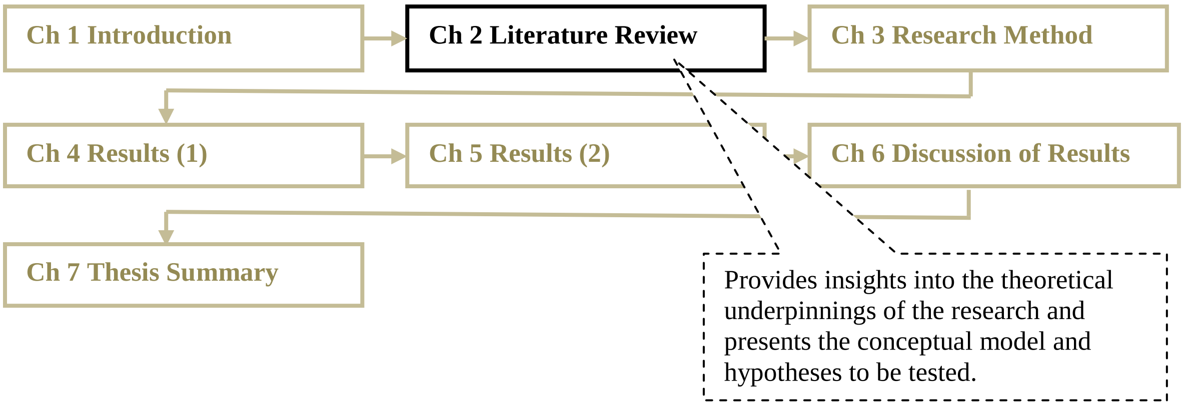
# Chapter 2
# Model Development




## 1.0 Introduction

Chapter 2 provides an overview of the conceptual model developed in this research. It explains the level of analysis adopted, theoretical foundations underpinning the conceptual model, the relevant constructs of interest, construct relationships, and the hypotheses developed. To provide a context for this discussion, the Chapter first examines entrepreneurship in a developing country context (since this research was undertaken in South Africa), the underlying reasons and/or motivations for entrepreneurs establishing businesses, and what is meant by the term “nascent entrepreneur” since the research design encompasses both nascent and non-entrepreneur groups.

Figure 2.1 presents the conceptual model underpinning this research. Building upon existing theory, the model identifies inter-relationships among personal values, entrepreneurial attitude, entrepreneurial intentions, and business start-up behaviour. In this research, the model is examined in terms of its applicability to two groups: nascent entrepreneurs and non-entrepreneurs. The model is discussed in detail in the following sections.

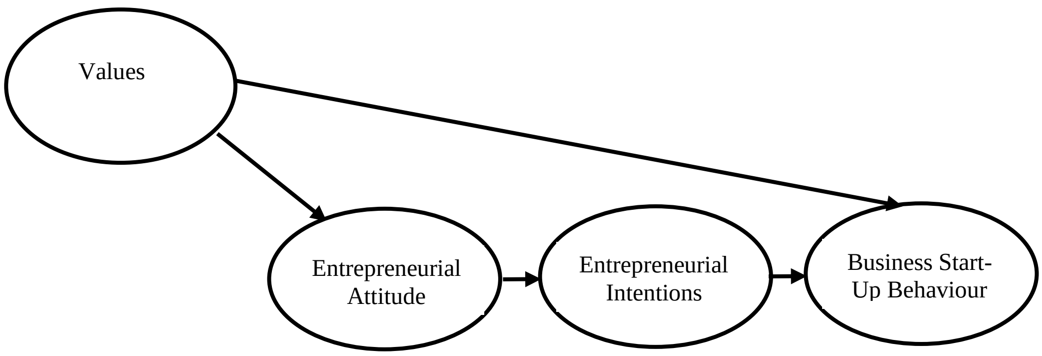



**Exhibit 2.1: Conceptual Model**

# 2.0 Entrepreneurship in a Developing Country

There has considerable research based on psychological, sociological, and economic approaches to entrepreneurship to better understand how and why entrepreneurs create new businesses and how entrepreneurship facilitates economic growth (Thornton, Ribeiro-Soriano, and Urbano, 2011; Shane and Venkataraman, 2000). In this research, the individual nascent entrepreneur's intention to create a new business and the psychological variables that play a role in stimulating the intention as well as the actual start-up behaviour are central issues. Although entrepreneurship does not necessarily require the creation of new business ventures (Shane and Venkataraman, 2000), this is a core issue in this research.

In this regard, Gartner (1985) presents a conceptual framework for describing new venture creation that integrates four major perspectives in entrepreneurship: The characteristics of the individual starting the venture, the organization he/she creates, the environment surrounding the new venture, and the process by which the new venture is created.

The focus of this research is the individual who intends starting a for-profit business and who puts into motion the necessary operational activities to start that business (Kirzner, 1997; Schumpeter, 2004) based upon an identified business opportunity (Casson and Wadeson, 2007; McMullen and Shepherd, 2006). Thus, implicit in the entrepreneurial process leading up to and starting a business is the entrepreneur's ability to discover, evaluate, and exploit an opportunity to create future goods and services (Shane and Venkataraman, 2000). In this research, this occurs in a developing country context – South Africa.

## 2.1 How Entrepreneurship Is Defined In This Research

There is no universal definition of entrepreneurship and, as (Davidsson, 2005) states, "… no one can claim to have the right answer to the question of what entrepreneurship really is" (p. 6). This research, however, embraces Davidsson's (2005) line of thinking about entrepreneurship in that …

> "… entrepreneurship consists of the competitive behaviours that drive the market process (Kirzner, 1973, pp. 19-20) … it is based jointly on behaviour and outcomes … (it) makes a difference, or else it isn't entrepreneurship … (and) it puts entrepreneurship squarely in a market context and makes clear that it is the suppliers who exercise entrepreneurship – not customers, legislators, or natural forces that also affect outcomes in the market." (p.6).

Although this interpretation of entrepreneurship has global applicability, entrepreneurship in a developing country, such as South Africa, can assume a different form than that observed in developed countries. Thus, it is important to explain what entrepreneurship means in a developing country context (Acs and Virgill, 2010). In developing countries, the terms entrepreneurship, small and medium enterprise (SME), petty capitalism, and the informal sector are often used interchangeably (Acs and Virgill, 2010, Smart and Smart, 2005) [2]. The reality is that in much of Africa, the majority of businesses are small traders comprised of, at best, only a handful of employees and family helpers (Fafchamps, 2001; Acs and Virgill, 2010). Although these businesses are fragile, the SME and informal sectors contribute significantly toward the GDP of these countries – particularly the SME sector (Ayyagari, Beck, and Demirguc-Kunt, 2003). For example, in South Africa, which is an "efficiency-driven", middle to low income economy characterised by a pursuit of higher productivity through economies of scale (Herrington, Kew, and Kew, 2010, p. 10), significant emphasis is placed on SMEs to generate jobs and to contribute toward the alleviation of poverty (Booyens, 2011). SMEs generate 50% of South African GDP and employ 60% of the labour force (Munshi, 2009). However, South Africa has not had a strong entrepreneurial culture as reflected by its being ranked 23rd out of 43 countries in the 2008 Global Entrepreneurship Monitor in terms of its early-stage entrepreneurship activity (Herrington, Kew, and Kew, 2008). The 2010 Global Entrepreneurship Monitor did report an improvement over previous years (Herrington, Kew, and Kew, 2010); however, the 2011 Global Entrepreneurship Monitor figures show no significant improvements over 2010 (Simrie, Herrington, Kew, and Turton, 2011). An extract from the 2011 Report provides insights into the positive and negative factors influencing entrepreneurship in South Africa (p.5):

> "As was the case in 2010, most experts rate the country's physical infrastructure highest in terms of stimulating entrepreneurial activity. In 2011, government entrepreneurship programmes score lowest, with much criticism levelled at the fact that a proliferation of government agencies with significant funding has failed to address the needs of entrepreneurs."

Thus, it is not surprising that South Africa was ranked toward the bottom of the 2012 Global Entrepreneurship and Development Index (Acs and Szerb, 2012). And, so, even though the South African Government has attempted to improve the level of entrepreneurial culture through introducing various strategies; these do not appear to have been all that successful and reflect a similar situation as was reported in the 2009 GEM Report (Herrington, Kew, and Kew, 2009).

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[2] "The informal sector is broadly characterised as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organisation, with little or no division between labour and capital as factors of production and on a small scale. Labour relations - where they exist - are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees." (OECD, 2003).

However, South Africa's nascent entrepreneurial activity is high when compared to some European countries. Its just that its overall level of entrepreneurship activity is low. South African entrepreneurs appear to be "good" at establishing new businesses but are not so good in ensuring that these businesses become sustainable (Booyen, 2011). However, for those South African businesses that do develop (most likely, many of these will be white opportunity-focused businesses), innovation rates are relatively high with SMEs reporting the highest rates and, thus, innovative entrepreneurs and micro enterprises are identified as being crucial targets for entrepreneurship and innovation policy (Booyen, 2011). In fact, Gauteng Provence (where Johannesburg is located and where this research was conducted), occupies a dual position in that it is regarded as an innovation hub but it also has the largest concentration of informal settlements and impoverishment (OECD, 2011).

Thus, entrepreneurship is critical for the economic development of developing countries since entrepreneurs plug key gaps in incomplete and underdeveloped markets that often exist (Leff, 1979). Market imperfections are addressed via entrepreneurs adopting "… various gap-filling and, perhaps, second-best solutions. In extreme cases, where market and non-market failures are pervasive, entrepreneurs are pushed out of the formal sector into the informal sector. In less severe cases, large diversified indigenous business groups have formed … Importantly, these groups engage in entrepreneurial behaviour … (Leff, 1978, p. 669) … " (cited in Acs and Virgill, 2010, p. 23). Thus, an important strategy for solving the economic ills of a country involves stimulating greater business activity and business start-ups since "… in the absence of the wealth-creating and job-creating activities of entrepreneurial businesses, the depth and extent of world poverty would be far greater (Singer, 2006, p. 225).

In this research, keeping in mind Davidsson's (2005) interpretation of entrepreneurship as well as a Schumpeterian perspective (where entrepreneurial businesses engage in innovation in the form of developing new products, entering new markets, and/or developing new processes), the distinction between entrepreneurship, SMEs, petty capitalism, and the informal sector is blurred but is informed by Davidsson's (2005) and Schumpeter's (2004) definitions. Of importance, however, "…as Schumpeter (1947, p.151) pointed out, … the "new thing" (whether it is a product, market, or process) need not be spectacular or of historical importance" (cited in Acs and Virgill, 2010, p. 27). Thus, in line with Acs and Virgill's (2010) thinking, this research embraces a broad interpretation of entrepreneurship.

## 2.2 Reasons for Starting Businesses: Opportunity *versus* Necessity Entrepreneurs

According to the 2002 Global Entrepreneurship Monitor (Reynolds, Bygrave, Autio, Cox, and Hay, 2002), there are two primary reasons or motivations why individuals engage in entrepreneurial activities. One reason is that they see a business opportunity and, as a result, they contemplate starting a business. A second reason is because there are no alternatives but to pursue the entrepreneurship path because they may not have a job and there may be little or no prospect of finding a job and so they feel compelled to start a business out of necessity (van Stel, Wennekers, Thurik, and Reynolds, 2004; Kelley, Singer, and Herrington, 2011). Using this classification, Reynolds, Bygrave, Autio, Cox, and Hay (2002) state that 97% of those who are entrepreneurially engaged can be defined as either “opportunity entrepreneurs” or “necessity entrepreneurs”.

Opportunity entrepreneurship is associated with starting a business because an individual identifies an opportunity and wants to exploit that opportunity. This form of entrepreneurship is driven primarily by role model effects of incumbent business ownership and population growth (van Stel, Wennekers, Thurik, and Reynolds, 2004). Where charitable social security systems exist – as in many developed countries, nascent entrepreneurs who want to set up businesses are “protected” if their businesses fail. Thus, opportunity entrepreneurship appears to be highest in more developed countries (for example, Norway) where generous social security systems exist and there is increasing per capita income (van Stel, Wennekers, Thurik, and Reynolds, 2004).

Necessity entrepreneurship, on the other hand, is about entering business because you have to - out of necessity. This is because individuals are “pushed” into self-employment since other employment options are either absent or unsatisfactory (Reynolds, Bygrave, Autio, Cox, and Hay, 2002). Necessity entrepreneurship is also driven by role model effects of incumbent business ownership and population growth (and so has this in common with opportunity entrepreneurship); however, there appears to be no relationship between the levels of social security expenditures provided in a country and levels of necessity entrepreneurship. Accessibility to computers is also negatively correlated with necessity entrepreneurship: Where there is access to technology, necessity entrepreneurship appears to be less prevalent (van Stel, Wennekers, Thurik, and Reynolds, 2004). Necessity entrepreneurship is at its highest in developing countries such as South Africa, Argentina, Brazil and Chile. Thus, necessity entrepreneurship is associated with countries where there is a decreasing function of per capita income and where more generous social security systems may be less prevalent (van Stel, Wennekers, Thurik, and Reynolds, 2004; Reynolds, Bygrave, Autio, Cox, and Hay, 2002; Acs, 2007) and/or in countries where there are uneven income distributions. As economic wealth levels increase, however, “necessity” decreases as a motivator for becoming an entrepreneur (Kelley, Singer, and Herrington, 2011).

In summary, although individuals may be voluntarily "pulled" into starting businesses because of the perceived attractiveness of the opportunities they have identified, not all individuals will be similarly and willingly motivated. Necessity entrepreneurs may not be affected or driven by the same factors as those that motivate opportunity entrepreneurs (Reynolds, Bygrave, Autio, Cox, and Hay, 2002; Acs, 2007). Thus, from a policy viewpoint, it is important to understand what the underlying entrepreneurial motivations are for individuals if effective entrepreneurship encouragement and facilitation programs are to be put in place.

Although any form of entrepreneurship will be economically beneficial for a country (Leff, 1979), opportunity entrepreneurs contribute most to economic development and necessity entrepreneurs least (Reynolds, Bygrave, Autio, Cox, and Hay, 2002; Acs, 2007). In this regard, a key indicator of economic development is the ratio of opportunity to necessity entrepreneurs in a country (Acs, Gorman, Szerb, and Terjesen, 2007). The greater the opportunity to necessity entrepreneur ratio, the greater a country's economic development levels (Acs, Gorman, Szerb, and Terjesen, 2007). Thus, there is an imperative to "transition" necessity entrepreneurs (who often establish businesses that may not be necessarily founded upon innovation and sustainable business opportunities) toward becoming more opportunity-oriented entrepreneurs. Separate entrepreneurial policies that target opportunity entrepreneurs as well as necessity entrepreneurs need to be developed. Where possible, entrepreneurial policy needs to support and facilitate opportunity-based entrepreneurship. Policies that target necessity entrepreneurs should be designed to educate them about the importance of having a greater opportunity focus and in developing innovation capabilities that may help to improve firm performance (Kreiser, Marino, and Weaver, 2002; Kropp, Lindsay, and Shoham, 2006).

## 2.3 Cultural Considerations

Cultural issues are not specifically addressed in this research and are not reflected in the conceptual model. However, South Africa, as a developing African country, will have a different set of cultural values than other (developed and developing) countries and this is acknowledged. Hence, for completeness, this Section provides a short discussion on culture generally, South African culture specifically, and cultures that appear to encourage entrepreneurship.

Culture is the collective programming of the mind that differentiates people in one category from another (Hofstede, 1989, 1993). It is the collective mental knowledge developed by a group of people exposed to a similar context (Geertz, 1973) as represented by the underlying system of shared values, beliefs, and expected behaviours specific to a particular collection of individuals or a society (Mueller and Thomas, 2001; Hayton, George and Zahra, 2002). Thus, our beliefs are influenced by culture and these, in turn, shape how we interpret our everyday experiences (McCracken, 1986).

Various studies have identified differences in nation cultures (Newman and Nollen, 1996). These include Hofstede (1980, 1993, 2003), Trompenaars (1993), Laurent (1986), Bond (1988), Schwartz (1994), and Schwartz and Bilsky (1990). The frameworks developed by Hofstede (1980, 1993) and Trompenaars (1993) are two of the most widely used. Of the two, Hofstede's framework has dominated the literature (Kirkman, Lowe, and Gibson, 2006). Hofstede's (1993) framework identifies five dimensions that distinguish nation cultures. These are individualism-collectivism, power-distance, masculinity-femininity, uncertainty orientation, and time-orientation/Confucian dynamism. Trompenaars' framework builds upon and enhances Hofstede's framework by examining cultural differences and how these affect doing business and managing (Trompenaars and Hampden-Turner, 1998). Trompenaars' framework utilises seven cultural values dimensions. These are universalism-particularism, individualism-communitarianism, achievement-ascription orientation, neutral versus emotional, specific versus diffuse, attitudes to time, and attitudes to the environment (Smith, Dugan and Trompenaars, 1996; Trompenaars, 1996; Trompenaars and Hampden-Turner, 1998).

In this research, Hofstede's framework is used to examine South Africa's culture because of this framework's popularity. Using Hofstede's (2011) 5-Dimensional Lens Model, with data about South Africa appearing on Hofstede's website (and national scores across each of the five dimensions ranging from "1" for the lowest to "120" for the highest), the following insights can be gleaned about South African culture (quoting from Hofstede, 2011 as per his website):

> **"Power Distance**
>
> This dimension deals with the fact that *all individuals in societies are not equal – it expresses the attitude of the culture towards these inequalities amongst us*. Power distance is defined as the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally**.**
>
> ***South Africa scores 49 on this dimension*** which means that people to a larger extent accept a hierarchical order in which everybody has a place and which needs no further justification. Hierarchy in an organization is seen as reflecting inherent inequalities, centralization is popular, subordinates expect to be told what to do and the ideal boss is a benevolent autocrat.
>
> **Individualism**
>
> The fundamental issue addressed by this dimension is ***the degree of interdependence a society maintains among its members***. It has to do with whether people´s self-image is defined in terms of "I" or "We". In Individualist societies people are supposed to look after themselves and their direct family only. In Collectivist societies, people belong to 'in groups' that take care of them in exchange for loyalty.

***South Africa, with a score of 65 is an Individualistic society***. This means there is a high preference for a loosely-knit social framework in which individuals are expected to take care of themselves and their immediate families only. In individualistic societies offence causes guilt and a loss of self-esteem, the employer/employee relationship is a contract based on mutual advantage, hiring and promotion decisions are supposed to be based on merit only, management is the management of individuals.

**Masculinity/Femininity**

A high score (masculine) on this dimension indicates that the society will be driven by competition, achievement and success, with success being defined by the winner / best in field – a value system that starts in school and continues throughout organisational behaviour. A low score (feminine) on the dimension means that the dominant values in society are caring for others and quality of life. A feminine society is one where quality of life is the sign of success and standing out from the crowd is not admirable. **The fundamental issue here is what motivates people, wanting to be the best (masculine) or liking what you do (feminine).**

***South Africa scores 63 on this dimension and is thus a masculine society***. In masculine countries people “live in order to work”, managers are expected to be decisive and assertive, the emphasis is on equity, competition and performance and conflicts are resolved by fighting them out.

**Uncertainty Avoidance**

The dimension Uncertainty Avoidance has to do with the way that a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? This ambiguity brings with it anxiety and different cultures have learnt to deal with this anxiety in different ways. **The extent to which the members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid these** is reflected in the UAI score.

***South Africa scores 49 on this dimension and thus has a preference for avoiding uncertainty***. Countries exhibiting high uncertainty avoidance maintain rigid codes of belief and behaviour and are intolerant of unorthodox behaviour and ideas. In these cultures there is an emotional need for rules (even if the rules never seem to work) time is money, people have an inner urge to be busy and work hard, precision and punctuality are the norm, innovation may be resisted, security is an important element in individual motivation.

**Long Term Orientation**

The long term orientation dimension is closely related to the teachings of Confucius and can be interpreted as dealing with society’s search for virtue, **the extent to which a society shows a pragmatic future-oriented perspective rather than a conventional historical short-term point of view**.

***No score is available for South Africa on this dimension***.”

In comparison, USA (and Australia) nation culture scores are as follows (Hofstede, 2011): Power Distance 40 (36); Individualism 91 (90); Masculinity/Femininity 62 (61); Uncertainty Avoidance 46 (51); Long Term Orientation 29 (31).

It is acknowledged that major differences in motivation, values, and cognition exist across nation cultures (Markus and Kitayama, 1991) with some cultures encouraging entrepreneurial activity more than others (McGrath, MacMillan, and Scheinberg, 1992). Although certain beliefs and values among entrepreneurs may be culture or ethnic specific, other perceptions and beliefs may transcend cultures (Busenitz and Lau, 1996). Those cultures that value risk-taking tend to be more entrepreneurial whereas those cultures that emphasise conformity tend to be less entrepreneurial (Hayton, George, and Zahra, 2002). Thus, culture is influential in contributing toward the levels of entrepreneurial behaviour in a country.

Within this context, McGrath, MacMillan, and Scheinberg (1992) identified a predictable set of values among entrepreneurs from across eight countries. Based on Hofstede's (1980) original four dimensions, they identified entrepreneurship as being associated with:

- high power distance
- high individualism
- high masculinity, and
- low uncertainty avoidance.

Using Hofstede's (2011) analysis of South African culture (discussed above) which identifies a preference for power distance (score of 49), high individualism (score of 65), high masculinity (score of 63), and a preference for avoiding uncertainty (score of 49), South African culture appears to be conducive toward entrepreneurship (comparing Hofstede's (2011) results to McGrath, MacMillan, and Scheinberg's (1992) results) – though South African culture exhibits only moderate uncertainty avoidance.

Having said this, a nation's culture may be comprised of a variety of sub-cultures. Hofstede (2001) acknowledges that cultural differences are pervasive across nations and communities and that many cultures can exist within a nation. People of Asian descent in the USA, for example, had greater than four times the rate of business ownership compared with Americans of African descent (Busenitz and Lau, 1996); however, it is acknowledged that Busenitz and Lau's (1996) study is 16 years old and that US demographic distributions may have changed since then.

South Africa is known as the "rainbow nation" because it is comprised of people from many different countries and cultures[3]. Thus, while there is an overarching South African national culture, it is acknowledged that there may exist a variety of sub-cultures in South Africa. Thus, drawing from McGrath, MacMillan, and Scheinberg's (1992) and Hayton, George, and Zahra's (2002) research, some parts of South African society may be more entrepreneurial than others.

### 2.3.1 Cultural considerations as they pertain to the conceptual model

Little research has been undertaken to examine how the theory of planned behaviour applies to different cultures (Linan and Chen, 2009). Yet, culture induces individuals in one community to engage in particular behaviours that may not be evident in other communities

[3] The term, "*Rainbow Nation*" was used by Archbishop Desmond Tutu to describe post-apartheid South Africa after its first democratic election in 1994.

(Linan and Chen, 2009). Thus, culture is sometimes conceived as a moderating variable between economic and institutional conditions, and entrepreneurship (Busenitz, Gomez, and Spencer, 2000; George and Zahra, 2002, Mueller, Thomas, and Jaeger, 2002). Hofstede, Noorderhaven, Thurik, Uhlaner, Wennekers, and Wildeman, (2004) identify two possible ways in which culture influences entrepreneurship: (1) via a positive combined effect whereby culture influences economic and social institutions leading these to be favourably inclined toward entrepreneurial activity; and (2) via a negative combined effect, where nation culture is unfavourable toward encouraging entrepreneurial activity, but where disgruntled individuals look for individual realisation via self-employment. Thus, from a theory of planned behaviour perspective, regardless of whether culture has a positive or negative effect on entrepreneurship, cultural values will influence the antecedents of motivational intentions; yet, few studies have specifically examined the effects of cultural differences on entrepreneurial intentions (Linan and Chen, 2009).

In terms of this research, South African cultural values are expected to influence motivational intention antecedents. This research, however, does not examine to what extent culture is manifested and embedded in the conceptual model. This is beyond the research questions addressed in this study. Based on successful applications of the theory of planned behaviour in other cultures, however (see, for example, Linan and Chen, 2009), it is expected that the conceptual model that is the focus of this research (and which is based on the theory of planned behaviour) is relevant in, and applicable to, a South African entrepreneurial context.

## 3.0 Nascent Entrepreneurship Defined

Whereas an entrepreneur starts and operates a business, a "nascent entrepreneur" is an individual who intends starting a business (McGee, Peterson, Mueller, and Sequeira, 2009). Various factors influence an individual to become an entrepreneur. These include a mixture of traits, personal attributes, experience, background, and dispositions (Krueger, Reilly, and Carsrud, 2000; Shane, Locke, and Collins, 2003; Baron, 2004; Arenius and Minniti, 2005).

In this research, the use of nascent entrepreneurs is necessary so as to be able to answer the research questions raised - in order to observe how they temporally progress toward business start-up. Using existing entrepreneurs would not be ideal since such individuals are already immersed in the entrepreneurship process; therefore, their perceptions as they relate to their attitude, intentions, and business start-up behaviour would be inherently retrospective and may be coloured by events and time.

Nascent entrepreneurs are yet to start a business but they have a longing to do so. In order to achieve their desire, they immerse themselves in particular activities that result in their entrepreneurial intentions reaching fruition (Carter, Gartner, and Reynolds, 1996). They are individuals "… who not only say they are currently giving serious thought to the new business, but also are engaged in at least two entrepreneurial activities, such as looking for facilities and equipment, writing a business plan, investing money, or organizing a start-up team" (Aldrich and Martinez, 2001, p. 43). In this research, a nascent entrepreneur is defined as an individual who has engaged in activities that are designed to produce a feasible business start-up (Aldrich and Martinez, 2001; McGee, Peterson, Mueller, and Sequeira, 2009). In accordance with Aldrich and Martinez (2001) and McGee, Peterson, Mueller, and Sequeira (2009), to be classified as nascent entrepreneurs, participants needed to have engaged in at least two of the following:

1. Attended a "start your own business" planning seminar or conference (all participants in this research were engaged in a one year entrepreneurship training and mentoring program)

2. Have written or be writing a business plan or have participated in seminars that focus on writing a business plan (in this research, not only were participants attending an entrepreneurship training and mentoring program, they were developing business plans for their businesses – though not all completed these)

3. Have or are putting together a start-up team (in this research, some participants actively worked on developing teams – either through using participants on the program and/or looking outside the program)

4. Be looking for a building or equipment for the business (in this research, around six months into the one year program, participants were provided with a business incubator environment, were mentored by experienced consultants, and were encouraged to identify suitable premises and/or equipment – though, raising the necessary funds for premises and equipment was problematic for most participants)

5. Have been saving money to invest in the business (in this research, few individuals had sufficient funds to save and invest in their businesses), and

6. Have been developing a product or service appropriate for their business (in this research, some had worked on developing their own products or services (for example, making and selling muffins to participants involved in the program (which subsequently turned into a cake shop) or selling a basic breakfast (two pieces of

bread, marmite, jam, and butter and a piece of fruit and juice contained in a zip-lock bag) to the B&Bs in SOWETO). Many, however, had no idea about the types of products or services they could offer and so needed mentoring and training support in this regard. Thus, to spark ideas in these participants, "technical" workshops were conducted that focused on possible business opportunities. Examples included how to make, package, and sell biltong – a form of cured meat (many South Africans love biltong), how to be a successful barista - learning how to make good coffee and sell it at road-side stalls, markets, etc., and how to select, cut, and conveniently package fresh vegetables that could be sold at markets or by the road-side.

Thus, the participants in this research satisfied the recommended nascent entrepreneur criteria identified by Aldrich and Martinez (2001) and McGee, Peterson, Mueller, and Sequeira (2009) in that they engaged in at least two of the identified prerequisite criteria.

## 4.0 Individual Level of Analysis

Over recent years, there has been an increasing trend in entrepreneurship research to investigate phenomena at the firm level where the unit of analysis is the firm. One potential reason for this is that there were perceived problems associated with some of the early psychological entrepreneurship research that identified the individual as the unit of analysis and which focused on demographic and/or personality/trait issues (see, for example, Gartner, 1988; Carsrud and Johnson, 1989; Carsrud, Olm, and Eddy, 1986). Since the focus of this research is on the individual, a discussion of pertinent issues as they relate to demographic and personality/trait studies follows. Pursuant to this, there is a discussion of the individual level approach adopted in this research that avoids the pitfalls of the demographic and personality/trait entrepreneurship studies.

*Demographic Approach*: The demographic approach focused on identifying certain demographic information, such as family background, race, and/or whether an individual was "first born", with the profile of an entrepreneur (see, for example, Brockhaus, 1982; Cohen, 1980; Hisrich, 1986). This stream of research was criticized for at least three reasons (Robinson, Stimpson, Huefner, and Hunt, 1991). First, demographic characteristics, such as family background, age, and parent's level of education, are not determinants of the making of an entrepreneur. These items provide meaning to our lives but do not determine behaviour. Ultimately, it is the conclusions an individual infers through dealing with particular situations that influences their behaviour (Rychlak, 1981 in Robinson, Stimpson, Huefner, and Hunt, 1991).

Second, some studies identified demographic characteristics as proxies for personality characteristics (see, for example, Watkins and Watkins, 1983). In these studies, "it is not the demographic characteristics themselves that affect entrepreneurship so much as the stable personality characteristics or traits developed by someone having those demographic characteristics" (Robinson, Stimpson, Huefner, and Hunt, 1991, p. 16).

Third, it was argued that demographic type research does not meet minimum social science research and/or theoretical standards (Beachard, 1989; Shaw and Costanzo, 1982) in that it does not help with "prediction". For example, education, birth order, and/or parent's background may result in differing conclusions when it comes to predicting entrepreneurship (Bowen and Hisrish, 1986; Hisrich, 1990). Also, demographic characteristics such as gender or age have been criticized because they are determined in the past and therefore cannot influence behaviour now or in the future.

Robinson, Stimpson, Huefner, and Hunt (1991), however, stress that demographic information about past (entrepreneurial) *behaviour* does not suffer from these inherent weaknesses since previous behaviour is a good predictor of future behaviour. Thus, if an individual has demonstrated entrepreneurial behaviour in the past, this may be a good predictor of the type of behaviour that can be expected from this individual in the future.

*Personality Approach*: The personality approach sought to profile entrepreneurs via the use of direct measurement of personality traits (see, for example, McClelland, Atkinson, Clark, and Lowell, 1953; McClelland, 1961). Concerns associated with personality (and/or trait) research focused on methodological and conceptual problems and included (Robinson, Stimpson, Huefner, and Hunt, 1991): (1) the research methodologies were not developed explicitly for evaluating entrepreneurship; (2) some instruments sometimes were deficient in convergent validity; (3) personality measures used in the research were typically developed for use across a range of generalized situations and can lose efficacy when applied in particular areas such as entrepreneurship; and (4) environmental influences were ignored (pp. 14-15). Thus, this stream of research was not supported.

*An alternative individual level approach*: There is little alternative to focusing on the individual when the research questions are at the individual level (as is the case in this research where the focus is on the individual nascent entrepreneur).[4] However, any

[4] Of note is that research at the individual level appears to be going through a resurgence with an increasing number of individual level studies being undertaken.

research approach at the individual level needs to avoid the shortcomings associated with the demographic and personality/trait approaches identified previously. In this regard, attitude theory has been identified as a credible alternative for examining individuals in the entrepreneurship domain (Robinson, Stimpson, Huefner, and Hunt, 1991; McLine, Bhat, and Baj, 2000). This approach overcomes the criticisms of the early personality and trait research whilst building upon the paradigms of the early research (Robinson, Stimpson, Huefner, and Hunt, 1991). Using attitudes, and drawing upon Ajzen's (1991) theory of planned behaviour, this research builds upon and extends the attitude research undertaken by Robinson, Stimpson, Huefner, and Hunt (1991 and McLine, Bhat, and Baj (2000) by adopting a longitudinal approach (their studies were cross sectional), by tracking individuals over time who started as nascent entrepreneurs, by including intentions and behaviour in the conceptual model (in line with Ajzen's (1991) theory of planned behaviour), and by including values as an antecedent to attitude (Rockeach, 1973).

## 5.0 Theoretical Foundations

Ajzen's theory of planned behaviour (Ajzen, 1985, 1987, 1991) provides the theoretical foundations that underpin this research. Underpinning Ajzen's theory (1985, 1987, 1991) is the prediction of behavioural performance from individual intentions to perform a specific behaviour. Cognitively, behaviour is a function of behavioural, normative, or control salient information or beliefs that are pertinent to the specific behaviour. These three types of beliefs result in the intention to behave in a particular manner with belief importance expected to change across situations and with different types of behaviour. The stronger an individual's beliefs about the personal and social attractiveness of engaging in a particular behaviour coupled with the individual's belief that he/she has the relevant skills and abilities to complete a particular task, the greater the probability he/she will behave in a particular manner. Thus, an individual's intention to engage in a particular behaviour is core to explaining why an individual acts in the manner he/she does.

Central to the research questions examined in this research is the examination, over time, of a group of individuals who have intentions to start businesses (nascent entrepreneurs) as they move toward establishing their businesses. Although some entrepreneurs start businesses in an unplanned manner (because opportunities present themselves and individuals decide to capitalize on situations and take advantage of the opportunities that have arisen), others formally plan to start businesses and take the necessary steps toward achieving this. It is this latter group that this research is interested in – nascent entrepreneurs who consciously plan to start businesses and who eventually engage in business start-up behaviour.

The theory of planned behaviour is relevant to this research situation because this theory is designed to predict and explain individual behaviour in particular contexts - where behaviour is assumed to be a function of relevant information or beliefs pertinent to that behaviour (Ajzen, 1991). Thus, aspects of the conceptual model that are reflected in this research (attitude, intentions, and behaviour) are drawn from the theory of planned behaviour.[5] This is appropriate since the theory of planned behaviour has been used in prior studies for predicting entrepreneurial intentions and behaviour (Elfving, Braanback, and Carsrud, 2009). For example, Engle, Dimitriadi, Gavidia, Schlaegel, Delanoe, Alvarado, He, Buame, and Wolff (2010) tested the ability of Ajzen's Theory of Planned Behavior to predict entrepreneurial intent in students in 12 countries. Kolvereid (1996) applied the theory to predict employment status preference intentions with first-year undergraduate students. Tkachev and Kolvereid (1999) examined the employment intentions of technical and medical students. Krueger, Reilly, and Carsrud (2000) applied a rival model approach to Shapero and Sokol's (1982) theory of entrepreneurial events in investigating the theory of planned behaviour. Autio, Keeley, Klofsten, Parker, and Hay (2001) used the theory of planned behavior to evaluate factors that impact entrepreneurial intent in university students. Kolvereid and Isaksen (2006) examined the theory but substituted self-efficacy (Bandura, 1986, 1997) for perceived behavioural control. Fayolle, Gailly, and Lassas-Clere (2006) used the theory to investigate the impact of an entrepreneurship teaching program. Souitaris, Zerbinati, and Al-Laham (2007) evaluated the effect entrepreneurship programs had on intention toward self-employment and nascence as a substitute for entrepreneurial behaviour. Linan and Chen (2009) tested the theory with human capital and demographic variables as antecedents of the determinants of entrepreneurial intentions.

Thus, as can be seen, although this list of studies is not definitive, the theory of planned behaviour has relevance in an entrepreneurship context. Underpinning the theory is an individual's *intention* to perform a particular behaviour: The greater the intention, the greater the propensity for that behaviour to occur. Thus, an intention is assumed to capture the underlying reasons or motivations for a behaviour; for example, how much an

[5] This research does not specifically examine the variables "subjective norms" and "perceived behavioural control" that appear in Ajzen's (1985, 1987, 1991) model since these variables are not core to the research questions addressed in this research.

individual is prepared to give to ensure a behaviour occurs. This, of course, is dependent upon an individual being able to control the behaviour occurring (volitional control). For example, an individual may intend to start a business but if he/she does not have the necessary resources available to do so, then the behaviour to start the business will not occur. Similarly, the lack of a suitable opportunity will restrict the behaviour from occurring. Thus, achieving a behaviour requires both intention and the ability to control a behaviour; however, in any given situation, only one of these variables may be more important than the other and thus only one may be needed to predict behaviour (Ajzen, 1991).

In this research, *perceived behavioural control* is not reflected in the conceptual model. Access to resources necessary to start a business in socially and economically disadvantaged areas are particularly limited. Thus, for many nascent entrepreneurs living in impoverished circumstances, it is expected that the lack of resource access will hinder the business start-up process notwithstanding their entrepreneurial intentions.

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| H1: | Not all nascent entrepreneurs will engage in business start-up behaviour. |
| H2: | An underlying reason for nascent entrepreneurs not starting their businesses will be a lack of access to the necessary resources. |

For accurate prediction, the theory of planned behaviour states that intentions must remain stable between the interval between the assessment of an intention and observation of the related behaviour. Intervening events can affect intention stability which, in turn, can affect behaviour prediction (Ajzen, 1991). In this research, the focus is on entrepreneurial intention (nascent entrepreneurs are the group of interest in this research) and thus, to the extent that there is a desire by nascent entrepreneurs to want to start businesses, it can be expected that their intentions will remain stable in the short term. The longer it takes, however, to move from nascence to start-up behaviour, the less likely it will be that entrepreneurial intentions will be a good predictor of business start-up behaviour.

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| H3: | Entrepreneurial intentions will be a good predictor of business start-up behaviour in the short term for nascent entrepreneurs. |
| H4: | Entrepreneurial intentions will be a poor predictor of business start-up behaviour in the longer term for nascent entrepreneurs. |

In addition to intentions, *attitude* toward a particular behaviour is also an integral component of the theory of planned behaviour. Attitude represents the extent to which an individual has a favourable or unfavourable predisposition toward a behaviour. The theory states that, as a general rule, the more favourable an attitude is toward a behaviour, the greater the intention to perform that behaviour (Ajzen, 1991). However, there is a distinction between a general attitude toward an object and an attitude toward a particular behaviour (Ajzen and Fishbein, 2005) with the latter more likely to result in specific action.

Attitudes, however, are dynamic and may be unstable over time and across situations (Abelson, 1982; Chaiken and Stangor, 1987; Rosenberg and Hovland, 1960). The extent to which an attitude changes depends both upon how deep-rooted an attitude is to an individual and the strength of a particular experience(s) that influences the attitude. Thus, an individual who is extremely passionate about starting a business may have an entrepreneurial attitude that is (relatively) unwavering. Similarly, attendance at an intense and comprehensive entrepreneurship training and mentoring program may have a significant effect on an individual's attitude toward entrepreneurship and his/her intention to start a business. In this research, entrepreneurial attitude as it relates to recognizing opportunities (McLine, Bhat, and Baj, 2000) is examined.

*Subjective norms* are the perceived social pressures to perform or not perform a particular behavior. They are also a key construct associated with the theory of planned behaviour. This construct is not specifically examined in this research, however, as the focus in this research is on values, attitude, intentions, and behaviour. As Ajzen (1991) states, in some situations, attitudes may have a significant impact upon intentions and therefore these alone may be sufficient to help explain intentions and behaviour. In other situations, however, two of the three independent variables underpinning the theory of planned behaviour (attitudes, perceived behavioural control, and/or subjective norms) may be required to account for intentions. In still other situations, all three independent variables may be required to make independent contributions.

*Antecedents*: Ajzen (1991) acknowledges that the theory of planned behaviour can both explain as well as predict behaviour by being able to include antecedents to the independent variables included in the model (attitudes, perceived behavioural control, and subjective norms) and which ultimately determine intentions and behaviour. Thus, attitudes, for example, develop from the beliefs individuals have about the object of an attitude where salient beliefs are considered to be an important determinant of behaviour (Ajzen, 1991). As Ajzen states (1991, p. 199),

> "The theory of planned behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory's current variables have been taken into account. The theory of planned behavior in fact expanded the original theory of reasoned action by adding the concept of perceived behavioral control."

Thus, in this research, values are included in the conceptual model as a predictor of both attitude and behaviour since beliefs and attitudes are guided by values (Rokeach 1973).

As Ajzen (1991, p. 206) also states,

> "… application of the theory of planned behavior to a particular area of interest … provides a host of information that is extremely useful in any attempt to understand these behaviors, or to implement interventions that will be effective in changing them (van Ryn & Vinokur, 1990)."

For this reason, the theory of planned behaviour informs this research in an entrepreneurial context. The theory is used to help understand the entrepreneurial attitudes, entrepreneurial intentions, and business start-up behaviour of nascent entrepreneurs, both before and after an entrepreneurship training and mentoring intervention is introduced, to investigate to what extent this intervention has on changing the variables of interest.

## 6.0 Conceptual Model

Whereas Figure 2.1 provided an overview of the conceptual model examined in this research, Figure 2.2 presents the conceptual model from a longitudinal perspective since this is how the conceptual model is operationalised in this research. Thus, the model reflects personal values, entrepreneurial attitudes, and entrepreneurial intentions measured at three points in time ($T_1$, $T_2$, and $T_3$) with business start-up behaviour measured at $T_3$. The following sections discuss the variables of interest, their inter-relationships, and related hypotheses.

### 6.1 Personal Values

The concept of values has been used by social science researchers to explain a range of behavioural phenomena including charity contributions, cigarette smoking, mass media usage, religious behaviour, drug addiction, and political inclination (Kamakura and Novak, 1992). Kropp, Lavack, and Silvera (2005) identified 30 marketing-related studies where values have been identified as influencing attitudes and behaviour in areas such as brand choice, gift-giving, shopping, and the consumption of organic foods. This research builds upon prior studies to investigate values in an entrepreneurial context in terms of its interrelationships with entrepreneurial attitude and business start-up behaviour (see, for example, Lindsay, Lindsay, and Kropp, 2009).

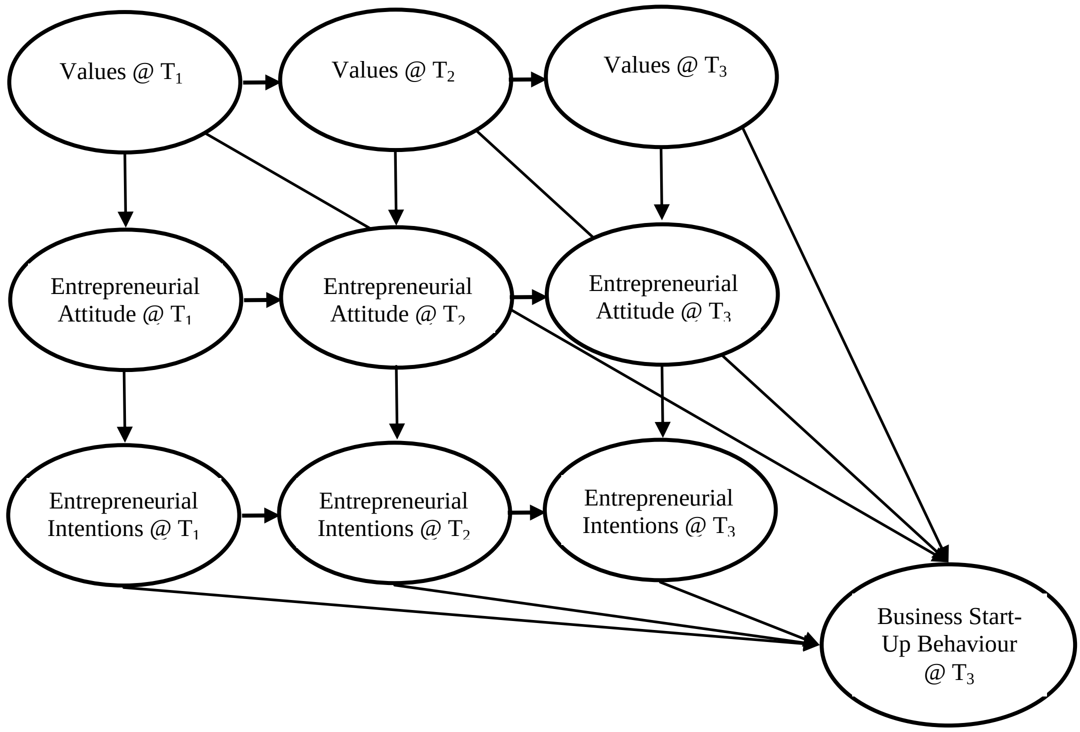


**Exhibit 2.2: Longitudinal Conceptual Model Examined In This Research**

Values are "enduring belief(s) that … specific mode(s) of conduct or end-state(s) of existence are personally or socially preferable to … opposite or converse mode(s) of conduct or end-state(s) of existence" (Rokeach, 1973, p. 5). Individuals use their values (and these, typically, are multiple values – Micken, 1992) to help rationalize and guide their beliefs, attitudes, and behaviours (Rokeach, 1973).

Values are essential to our functioning and are considered to be the most significant construct in the social sciences field (Rokeach, 1973). Values embody cognitive representations of common human conditions in terms of biological needs, social interactional requirements, and/or social institutional demands placed on an individual (Schwartz and Bilsky, 1987). They operate as essential motivations for fundamental psychological needs (Rokeach, 1973) and represent conceptions of desirable influences in terms of how individuals choose behaviours and appraise their worlds (Schwartz and Bilsky, 1987). From a social adaptation theory perspective, values can be interpreted as abstract cognitions that individuals employ to store and channel general classes of stimuli (Kahle, 1983; 1996). McCracken (1986) says that values provide a "filter" through which individuals perceive their world providing a sense of order to help us to interpret our world.

Values are thought to be significantly influenced by pre-adult socialisation and are considered to be situationally invariant (Schwartz, 1992); that is, they appear to be relatively stable over time. Values, however, may change if there are significant events that challenge an individual's value system (Kahle, 1983; Kahle, Poulos, and Sukdial, 1988; Rokeach and Ball-Rokeach, 1989).

There is general agreement that values do influence our behaviour (see, for example, Kahle, 1983; Kahle, Poulos, and Sukdial, 1988; Rokeach and Ball-Rokeach, 1989). Kamakura and Novak (1992) state that a value system provides an understanding of the motivational forces that drive an individual's beliefs, attitudes and behaviours. Changes in values can cause changes in the reasons products are purchased, changes in different purchase quantities of the same product, changes in varying levels of satisfaction with product purchases, and changes in consumption of different products (Kropp, Lavack, and Silvera, 2005). This research investigates whether nascent entrepreneurs have different value sets compared to non-entrepreneurs and whether values have explanatory power in influencing entrepreneurial attitude and business start-up behaviour. Thus,

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| H5: | There will be a relationship between values and business start-up behaviour for both nascent and non-entrepreneurs. |
| H6: | Values will be stable over the life of the research project for both nascent and non-entrepreneurs. |
| H6.1: | Nascent entrepreneurs will have different values to non-entrepreneurs. |

A review of the business and marketing literature shows that there are three value systems that feature the most … Rokeach's (1973), Kahle's (1983), and Schwartz and Bilsky's (1987) (with Mitchell's (1983) in fourth place). The relative importance of different values to an individual has frequently been measured using the method developed by Rokeach (1973). Rokeach (1973) operationalized behavioural modes with 18 instrumental values and with 18 terminal value end-states. Rokeach (1973) argues that values can be ordered from the most to the least important within each set. Kahle and others developed a more parsimonious alternative to Rokeach's (1973) values set that is commonly known as the "List of Values" or "LOV" (Kahle, 1983, 1996; Kahle, Beatty, and Homer, 1986). LOV is based on Maslow's (1954) hierarchy of needs, Rokeach's (1973) research, Feather's (1975) research, as well as on social adaptation theory (Kahle, 1983). LOV has proven popular in values-oriented business related marketing research as it is succinct and because it demonstrates excellent psychometric properties (Kahle, 1996; Shoham, Rose, and Kropp, 2005).

LOV contains nine basic values. These are sense of belonging, fun and enjoyment in life, warm relationships with others, self-fulfilment, being well-respected, excitement, security, self-respect, and sense of accomplishment. These nine values can typically be divided into a three-dimensional structure: internal values, external values, and interpersonal values. *Internal values* are validated internally and do not require the real or imagined presence of others (Kropp, Lavack, and Silvera, 2005). The internal values are self-fulfillment, self-respect, and sense of accomplishment. *External values* include sense of belonging, being-well respected, warm relationships with others, and security. External values generally do require the judgments, opinions, or presence of others (Kahle, 1983). *Interpersonal values* (fun and enjoyment in life and excitement) are interactional and combine aspects of internal and external values (Kahle, 1983).

**Internal Values**: Prior research demonstrates entrepreneurs as being internally grounded and focused and having a strong belief in self (Kropp and Lindsay, 2001). As such, it is likely that nascent entrepreneurs will demonstrate higher internal values than external or interpersonal values. In contrast, non-entrepreneurs, who will display a variety of motivations and beliefs, are more likely to exhibit the complete range of internal values (from low to high levels). This will be tempered by the environmental influences they were exposed when their values set was developing as well as any values that they inherited from prior family generations. Therefore,

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| H7: | Nascent entrepreneur internal values will be higher than non entrepreneurs. |

**External Values**: Entrepreneurs need to be good communicators and need to be able to network (Timmons and Spinelli, 2009) as they do not need to have all the answers themselves if they have a problem but need to be able to access relevant information from others. Similarly, non-entrepreneurs will need to be able to network and develop their social capital for them to be able to develop their careers. As such, it is likely that nascent entrepreneurs will display similar external values levels as non-entrepreneurs. Therefore,

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| H8: | There will be no differences in nascent entrepreneur and non-entrepreneur external values. |

**Interpersonal Values**: Interpersonal values include fun and enjoyment in life and a sense of excitement. Although they reflect aspects of internal and external values, they are separate from internal and external values. What constitutes fun and enjoyment and excitement will be influenced, in part, by definition and the situation at hand. Although both nascent entrepreneurs and non entrepreneurs will develop interpersonal values in different ways, it is likely that there will be no interpersonal values differences between the two groups. Thus,

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| H9: | There will be no differences in nascent entrepreneur and non-entrepreneur interpersonal values. |

In addition, life in socially and economically disadvantaged communities is hard. Trying to survive is a challenge and can be a day-to-day struggle for many. Although everything is relative, fun and enjoyment takes on a different meaning when one is exposed to poverty and there may not be much of this. Thus, interpersonal values may be significantly less important in these types of environments compared to internal and external values regardless of whether you are a nascent or non-entrepreneur. Thus,

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| H10: | Interpersonal values will be lower than internal and external values for both nascent and non-entrepreneurs. |

## 6.2 Entrepreneurial Attitude

Understanding attitude within an entrepreneurial context has attracted the attention of various scholars (see, for example, Caliendo, Fossen, and Kritikos, 2009; Krueger, Reilly, and Carsrud, 2000; Sankelo and Akerblad, 2008; Elston and Audretsch, 2010, 2011; Burmeister-Lamp, Lévesque, Schade, 2012). An attitude can be thought of as a tendency to respond in a favourable or unfavourable way toward an attitude object (Ajzen, 1982). Attitudes can exist at general or specific levels and so attitude measurement needs to complement the type or attitude being measured (thus, understanding whether it is general or specific is important). As Ajzen and Fishbein (2005) state, there are differences between general attitudes toward an object and attitudes toward performing a specific behaviour with the latter more likely to produce action. Measuring an attitude toward a *specific* object, such as entrepreneurship, requires measurement specificity (Robinson, Stimpson, Huefner, and Hunt, 1991). Getting this right - measurement specificity - results in enhanced accuracy of the specific attitude measurement being taken as well as increased predictability because of the increased precision (Robinson, Stimpson, Huefner, and Hunt, 1991). Thus, entrepreneurial attitude is an attitude toward a specific object (entrepreneurship) and so requires an instrument that matches measurement specificity to that attitude specificity.

The instruments for measuring entrepreneurial attitude as developed by Robinson, Stimpson, Huefner, and Hunt (1991) and McCline, Bhat, and Baj (2000) are specifically designed for measuring entrepreneurial attitude and therefore derive the benefits outlined above. In addition, both instruments overcome limitations that have been associated with other attitude measures in that (1) they have been founded upon existing attitude theory and (2) development of their measures have followed appropriate scale development and validation procedures.

Both entrepreneurial attitude instruments are based on a tripartite model (as distinct from a univariate model (Fishbein and Ajzen, 1975)) that is founded upon three underlying reactions to an object: affect (positive or negative feelings toward an attitude object), conation (behavioural intentions and dispositions to behave in a given way toward an attitude object), and cognition (beliefs and thoughts an individual has toward an attitude object) (see, for example, Ajzen, 1982; Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1977; Rosenberg and Hovland, 1960; Shaver, 1987). Thus, entrepreneurial attitude is interpreted to be a function of all three types of responses to the specific entrepreneurial object (Robinson, Stimpson, Heufner, and Hunt, 1991).

Overlaying the affect, conation, and cognition attitude reactions is a need for specificity toward entrepreneurship. In this regard, Robinson, Stimpson, Heufner, and Hunt (1991) developed a multidimensional entrepreneurial attitude orientation scale (EAO). Their EAO scale was derived from the work of McClelland, Atkinson, Clark, and Lowell (1953) and McClelland (1961) into need for achievement; Levenson (1973) and Rotter (1966) into locus of control; Crandall (1973) into self-esteem; and Kirton (1976, 1978) into innovation. Based on this prior research, Robinson, Stimpson, Heufner, and Hunt (1991) developed four entrepreneurship sub-scales. Each of these, in turn, was comprised of three attitude components (affect, conation, and cognition).

The four sub-scales are achievement in business (which refers to the results achieved in starting and growing a business), innovation in business (which involves perceiving and acting in new and innovative ways with regard to the business), perceived personal control of business outcomes (relating to an individual's perception of control in being able to manipulate his/her business' activities), and perceived self-esteem in business (as related to self-confidence and/or perceived competency in relation to his/her business).

These four subscales were not meant to be definitive as entrepreneurship is a complex phenomenon and so Robinson, Stimpson, Heufner, and Hunt (1991) state that their scales were meant to be a starting point only for further research. In this regard, McCline, Bhat, and Baj (2000) believed that two important entrepreneurship components were absent from the EAO scale: risk taking and opportunity recognition. Although their attempt to develop a risk-taking scale was unsuccessful, they achieved success in developing an attitude opportunity recognition scale. They called their entrepreneurial attitude scale, the entrepreneurial opportunity recognition or EOR scale. EOR was founded upon an attitude of looking for unmet needs based upon the understanding that successful venturing may be dependent upon the ability to recognise or distinguish an idea from an opportunity. Since opportunity recognition is key to entrepreneurship (Venkatraman, 1997), this research adopts the EOR scale for measuring entrepreneurial attitude in nascent and non-entrepreneurs. This scale was successful in distinguishing entrepreneurs from non-entrepreneurs. Building upon and extending McCline, Bhat, and Baj's (2000) entrepreneur study, in this research, it is hypothesised that *nascent* entrepreneurs will have greater entrepreneurial attitudes than non entrepreneurs.

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| H11: Nascent entrepreneurs will have a stronger entrepreneurial attitude than non-entrepreneurs. |

### 6.2.1 Entrepreneurial Attitude and Values

At an overarching level and based on prior studies, it is anticipated that there will be a values-entrepreneurial attitude relationship (Rokeach, 1973). More specifically, this relationship will be manifested in lower level values relationships discussed below.

*Entrepreneurial Attitude and Internal Values*: The entrepreneurship domain tends to attract individuals who feel empowered to start and grow businesses and, in so doing, to be in greater control of their lives – through creating or seizing opportunities without regard to the resources they control (Stevenson and Jarillo, 1990). Thus, nascent entrepreneurs intending to start businesses will have an opportunity focus – they will be looking for business opportunities. In so doing, they will display an underlying self-belief that will manifest itself in a positive entrepreneurial attitude toward recognizing opportunities – they will believe that they are able to recognize opportunities that will translate into successful businesses. This will be associated with a heightened sense of self-respect and self-fulfilment. As such, their internal values will play an instrumental role in shaping their attitude toward opportunity recognition.

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| H12: Nascent entrepreneurs will exhibit a positive internal values-entrepreneurial attitude relationship. |

*Entrepreneurial Attitude and External Values:* External values are concerned with how we act in the real or imagined presence of others. External values will be valuable to nascent entrepreneurs because these values help them to access information from others that may not have. Nascent entrepreneurs will appreciate that help and support will be required from others inside and outside their businesses to achieve their goals and that to achieve success, they will need to network, communicate, and develop relationships. Thus, nascent entrepreneurs will understand that they may need to utilise others to assist them search for, recognize, and exploit opportunities. It is expected, therefore, that their external values will be beneficial to their leveraging off others as a means of recognizing and exploiting suitable business opportunities. As such, it can be expected that nascent entrepreneur external values will be positively related to their entrepreneurial attitude.

> H13: Nascent entrepreneurs will exhibit a positive external values-entrepreneurial attitude relationship.

*EOR and Interpersonal Values:* Nascent entrepreneurs are individuals who derive pleasure from challenges and the fun and excitement that goes with accomplishing these challenges. However, identifying and exploiting opportunities is serious – particularly when this underpins an individual's social and economic wellbeing … when an individual's future depends upon identifying an opportunity that will generate a revenue stream that will allow them to survive. As such,

> H14: Nascent entrepreneurs will <u>not</u> exhibit a positive interpersonal values-entrepreneurial attitude relationship.

## 6.3 Entrepreneurial Intentions

Individuals are disposed toward intentions based on a combination of personal and contextual factors (Ajzen, 1991). They develop attitudes toward undertaking certain behaviours founded upon their values/beliefs. Intentions result from attitudes and become the immediate determinant of behaviour (Fishbein and Ajzen, 1975; Ajzen, 1991). In other words, values drive attitudes which, in turn, drive intentions which ultimately drive behaviours. Drawing upon this early pioneering work, it is expected that …

> H15: There will be a relationship between entrepreneurial attitude and entrepreneurial intentions for nascent entrepreneurs.

Research into intentions has evolved since the 1970s. Early intentions studies drew upon social learning theory (Bandura, 1977); however, the results were lacking in terms of explanatory power and predictive validity (Krueger, Reilly, and Carsrud, 2000). Thus, a more promising research direction was taken that drew upon Ajzen and Fishbein's (1977) and Ajzen's (1985, 1991) theory of planned behaviour.

Krueger's (1993) entrepreneurial intention model, that defines entrepreneurial intentions as a commitment to commence a business, similarly draws upon Ajzen and Fishbein's (1977) and Ajzen's (1985, 1991) theory of planned behaviour (as well as Shapero's (1982) theory of an entrepreneurial event). Whereas Shapero's (1982) theory positions entrepreneurial intentions as a function of an individual's perception of the feasibility, desirability, and propensity to act, the theory of planned behaviour identifies (entrepreneurial) intention as a function of an individual's attitude, subjective norms, and perceived feasibility (control) (Hindle, Klyver, and Jennings, 2009). Both Ajzen's (1991) model has been supported in the entrepreneurship literature (Krueger, Reilly, and Carsrud, 2000; Shook, Priem, and McGee, 2003) as well as Shapero's (1982) model (Krueger, 1993; Krueger, Reilly, and Carsrud, 2000; Shook, Priem, and McGee, 2003).

Although Bird (1988) was an early pioneer of entrepreneurial intentions, Krueger (1993, 2000, 2003), in association with various colleagues (Krueger and Dickson, 1993, 1994; Krueger and Brazeal, 1994; Krueger and Carsrud, 1993; Krueger, Reilly, and Carsrud, 2000; Shepherd and Krueger, 2002), have developed "the most prominent and sustained body of (entrepreneurial intentions) work in the field" (Hindle, Klyver, and Jennings, 2009, p. 36). Thus, Krueger's (1993) entrepreneurial intentions model (as well as the theory of planned behaviour) is widely utilised in predicting entrepreneurial intentions and behaviour (Elfving, Brannback, and Carsrud, 2009). This model identifies the primary factors underpinning the development of entrepreneurial intentions to be the perceived feasibility and perceived desirability of an entrepreneurial opportunity. In depicting this model, Douglas (2009) suggests that McMullen and Shepherd (2006) use knowledge as a substitute for perceived feasibility and their appetite for bearing risk as a substitute for perceived desirability. Other authors support this notion that the nascent entrepreneur's possession of former proprietary knowledge and his/her consequent alertness underpins the development of the intention to become an entrepreneur (Kirzner, 1973, 1979; Gaglio and Katz, 2001; Gifford, 2003).

Although intentions are indeed important, there are those who argue that too much research attention is placed on intentions and not enough is given to behaviour (Schenkel, Hechavarria, and Matthews, 2009; Davidsson and Honig, 2003). They argue that this is a major reason why research into new venture creation does not engage enough with knowledge about social and human capital (Hindle, Klyver, and Jennings, 2009). Yet, the acquisition of relevant knowledge and experience, as sources of human capital, inform new venture creation decisions together with the social capital non-redundant information that entrepreneurs derive from their social networks and surroundings that allows them to enhance their entrepreneurial performance (Hindle, Klyver, and Jennings, 2009). Thus, Hindle, Klyver, and Jennings (2009) argue for an enhanced model of entrepreneurial intentions that builds upon Krueger's (1993) model and which includes human and social capital as endogenous variables in the model. They argue that with human and social capital included, the model is no longer about intention to start a business or not; it is about "*informed intent*" to start a business –where entrepreneurial intention is informed by human and social capital (p. 45). They argue that an informed intent model will become the basis for intention research of the future and that because there are experience differences between men and women, there will need to be a clear distinction in future entrepreneurial intentions research based on gender.

A final point on entrepreneurial intentions is that they may change over time (Krueger, 2009). Entrepreneurial decision making is not linear. Effectuation theory demonstrates this (Sarasvathy, 2001). As goals change, entrepreneurs develop different pathways toward achieving those goals. Thus, entrepreneurial intentions similarly may evolve in a non-linear manner. Krueger (2009) states that, "We certainly may wish to think about intentions as a stepwise process and consider modeling intentions toward each step" (p.58) and that "… it might be quite rewarding to monitor entrepreneurial intentions at both the overall level and for each step of their trajectory "(p. 70). Thus,

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| H16: Entrepreneurial intentions will be non-linear over time for both nascent and non-entrepreneurs. |

Krueger (2009) also raises the issue of bricolage (Baker and Nelson, 2005) and intent. He raises the question, "If entrepreneurs move forward with limited resources and must improvise with what they perceive as available, then what does that mean for how we model intent?" (p. 58). Thus, consider the intentions model applied to nascent entrepreneurs who have access to a plentiful supply of scarce resources versus the situation where the nascent entrepreneurs have little or nothing in the way of scarce resources and there is no prospect of accessing any of these without begging or stealing (this latter scenario parallels the environment reflected in this research). Krueger (2009) states that although the model should hold overall, the variance explained may be "masking some deeper issues" (p. 58). Unfortunately, addressing this question is beyond this research and, in this regard, there is a need for a comparative entrepreneurial intentions study that includes both more affluent as well as the economically disadvantaged nascent entrepreneurs.

### 6.4 Business Start-Up Behaviour

In this research, business start-up behaviour is the ultimate dependent variable in the conceptual model. It is measured at the individual level. Business start-up behaviour involves a nascent entrepreneur starting a business; it is an aspect of entrepreneurial behaviour. Entrepreneurial behaviour is the "proximal outcome of the cognitions and emotions of entrepreneurial actors"; it causes venture outcomes (Bird and Schoedt, 2009, p. 327). It involves a complex set of discrete units of action steps – some being done sequentially, some being done iteratively and always with interruptions - that can be observed by others. These action steps or activities are selected with the intention of identifying and developing an opportunity that will underpin a business venture comprised of a range of intellectual, financial, physical, human, and social resources (Bird and Schoedt, 2009).

Nascent entrepreneurs draw upon their personal capital (including their experience, skills, knowledge, abilities, cognitions, intentions, and motivations) as well as their social capital to facilitate entrepreneurial behaviour (Bird and Schoedt, 2009). The actual business start-up (as distinct from start-up behaviour) can result in product innovation, employment creation, and the generation of financial wealth (Bird and Schoedt, 2009). If successful, both economic and social value contributions will be made to the surrounding community (Davidsson, Delmar, and Wiklund, 2006; Mitchell, Busenitz, Bird, Gaglio, McMullen, Morse, et al., 2007). Thus, while nascent entrepreneurs *may* engage in business start-up behaviour, non-entrepreneurs will not be so inclined as they will lack the personal and social capital to initiate a business. Thus,

| H17: Non-entrepreneurs will not engage in business start-up behaviour. |
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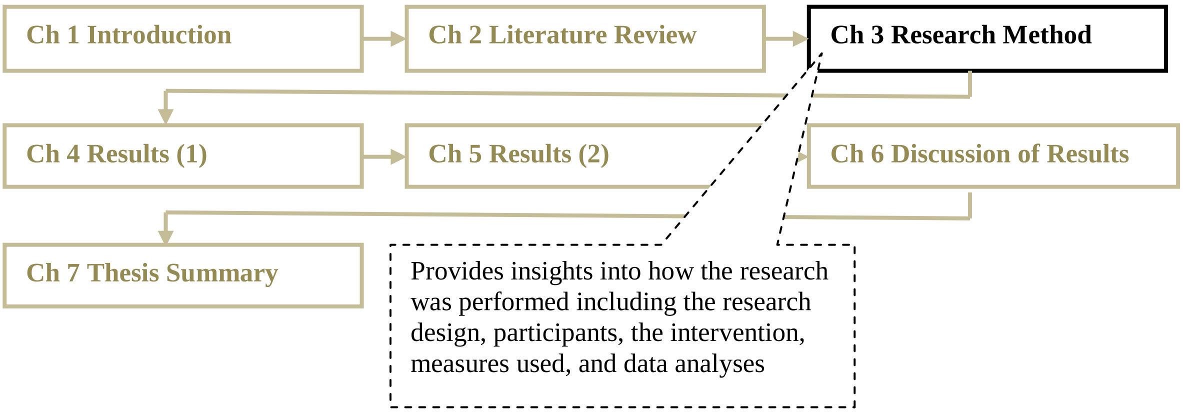
While the importance of entrepreneurial behaviour is acknowledged, there is a relative paucity of research into entrepreneurial behaviour. Although behaviours are observable, most studies rely on participant self-reports such as that undertaken by DeTienne and Chandler (2007) that involved participant self-reports of individual action sequences. A limitation of self-reports, however, is that these are restricted by recall accuracy and social desirability – the propensity toward providing socially desirable but possibly untruthful results (Bird and Schoedt, 2009). Thus, Bird and Schoedt (2009) call for a move beyond self-reports of behaviour.

In this research, self-reports were used but this was complemented with trainers and mentors working with participants to help them develop their businesses. This provided a form of "monitoring" of the participant self-reporting that occurred leading to greater data integrity.

## 7.0 Chapter Summary

This Chapter provides an overview of the conceptual model including the variables of interest, their inter-relationships, and the hypotheses developed. The model is founded upon the theory of planned behaviour and it examines entrepreneurial attitude, entrepreneurial intention, and business start-up behaviour as these variables evolve over time. The model augments existing theory by including personal values as an antecedent of entrepreneurial attitude and it does this within a context characterized by social and economic disadvantage. Both nascent and non-entrepreneur groups are examined.

# Chapter 3
# Research Method




## 1.0 Introduction

Chapter 3 describes the research method adopted in this research. It provides specific details about the research approach adopted, research design, the research participants, how the participants were recruited, the entrepreneurial training, mentoring, and business incubation program intervention that was integral to the project, the questionnaire used in the research, the scales used to measure the model constructs, and the method used to analyse the data.

## 2.0 Research Approach

A research method acts as an intermediary between a framework of ideas and an area of enquiry thereby facilitating the methodological acquisition of novel insights about a particular phenomenon within the area of enquiry (Neuman, 2005). There are a variety of research methods available. This research adopts a quantitative approach because (Neuman, 2005) it:

- Tests hypotheses that the researcher is interested in
- Uses measures that have been systematically created before data collection
- Embraces underlying theory that has been generated that is primarily causal and deductive
- Uses standard procedures whereby replication of results is assumed
- Uses data that is in the form of numbers taken from defined measurements
- Uses concepts in the form of distinct variables, and

- Adopts a data analysis approach that uses statistics, tables, and/or charts to demonstrate how the data collected relates to the underlying hypotheses generated.

A particular research method draws its conceptual foundations from various philosophical perspectives such as those being positivist, interpretive, or critical in nature (Neuman, 2005). Each perspective differs conceptually in its approach to the interpretation of particular phenomena. The choice of a particular perspective determines the fundamental ontological and epistemological assumptions about the phenomena through the choice of an appropriate research methodology.

Two of the most used approaches are the positive or interpretative approaches (Crotty, 1998). A *positivist* approach is founded upon the existence of a priori fixed relationships within phenomena, it characteristically investigates these relationships with structured instrumentation, and its primary focus is theory testing in an endeavour to improve the predictive understanding of particular phenomena (Crotty, 1998). An *interpretive* approach assumes that multiple realities exist that are founded upon one's subjective perception of reality (Crotty, 1998). Thus, objects of interest are understood by evaluating the meanings that individuals assign to those objects. Whereas a positivist approach attempts to generalise from "the particular" to a population, the aim of an interpretative approach is to understand the underlying composition of a particular phenomenon (Neuman, 2005).

This research adopted a positivist approach for the following reasons. First, the research employed objective scientific methods and mathematical analyses to exemplify and examine relationships among the range of variables of interest (Neuman, 2005; Chen and Hirschheim, 2004). Second, based on existing theory, underpinning the research was a linear and logical series of hypothetical causal relationships among the variables of interest containing specified expectations about the likely outcomes of those relationships. Third, for the reasons stated above, it was deemed that a quantitative approach (a survey questionnaire) – that generally underpins positivist research – best suited this research since an objective of the research was generalisation and replication of results (Neuman, 2005; Crotty, 1998). With this approach, knowledge augmentation occurred via collecting data from a representative sample derived from the population of interest.

## 3.0 Research Design

Exhibit 3.1 provides an overview of the research design. The design was longitudinal using repeated measures at three points in time. This was necessary to monitor the effects of a one-year entrepreneurial training, mentoring, and business incubation intervention program on participants' personal values, entrepreneurial attitude, entrepreneurial intentions, and entrepreneurial business start-up behaviour.

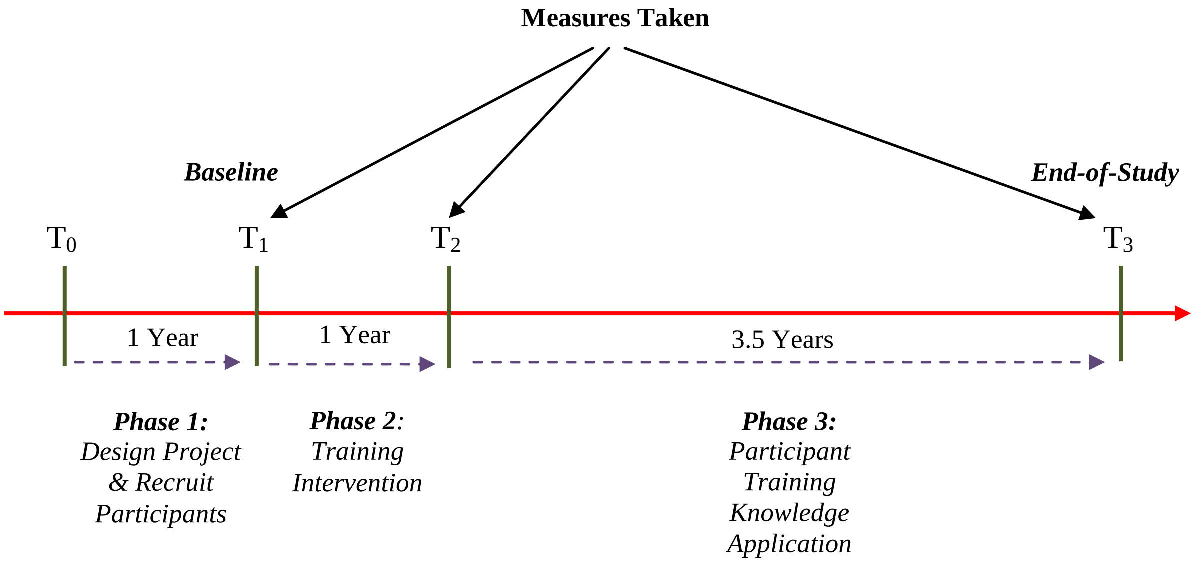



**Exhibit 3.1: Overview of the Research Design**

Repeated measures designs (referred to as latent growth models or growth models in structural equation modeling terminology) examine the development of an individual on one or more outcome variables over time to evaluate whether there are any emergent trends. The outcome variables can be observed variables or latent variables (Muthen and Muthen, 2010). At least two responses from a single individual must be obtained. These responses must be "matched" at each point that data is collected and given "special treatment" so as to be able to deal with a lack of independence of the data, to control for individual-level differences that may affect the within-group variance (Hair, Black, Babin, and Anderson, 2009).

In this research, repeated measures were taken at three points and then individually matched with each participant for analysis purposes. Measures were taken (1) at the commencement of the research project immediately prior to introduction of the training intervention (referred to as Baseline or $T_1$), (2) one year after the start of the intervention (at $T_2$) – which was when the intervention was completed, and (3) 3.5 years after the completion of the intervention (at $T_3$) – to view to what extent the effects of the intervention had a lasting effect. The project started in 2003. The duration of the project from $T_1$ to $T_3$ was 4.5 years which encompassed three research phases.

*Phase 1*: The duration of Phase 1 was one year. Phase 1 involved establishing a steering committee to assist the project over Phases 1 and 2. The committee was involved at both the strategic and operational levels. The committee comprised both research and training personnel who were experienced in pedagogy. Phase 1 involved designing and developing the intervention program and recruiting participants (see below).

*Phase 2*: Phase 2 involved delivery of the intervention program. Phase 2 spanned all of 2004. The intervention program used lecture rooms for the training and part of an empty warehouse facility for the mentoring and business incubation components.

*Phase 3*: Phase 3 occupied the period immediately after the training intervention. The duration was over 3.5 years from January 2005 to July 2008. Phase 3 provided participants with the time to reflect upon and digest the knowledge they gained during the intervention and to then act upon this knowledge.

## 3.1 Research Environment

The location for the research was Johannesburg, South Africa. South Africa consists of both third and first world economies with only a small percentage of the previously disadvantaged South African people contributing at the first world level. Unemployment is endemic in South Africa. This has contributed toward social and economic problems in other areas including low education for most, inadequate health services, and high levels of crime (OECD, 2010). Official statistics indicate that in the third quarter of 2010, unemployment levels were 29.80% black South Africans, 22.30% coloureds, 8.60 Asians, and 5.10% whites (Statistics South Africa, 2010). In September 2010, it was estimated that more than a third of South Africa’s workforce were unemployed including more than half of black South Africans aged between 15 to 34 years (Dugger, 2010).

South Africa is ranked in the top 10 countries in the world for income inequality with respect to the distribution of family income (CIA, 2008). Rural poverty rates are by far the highest; however, they appear to be decreasing slightly with urban poverty rates on the increase (OECD iLibrary, 2010). Although there is an extremely affluent black South African middle class, overall black South Africans are the poorest in the country (see, for example, OECD iLibrary, 2010; Salo, 2011). The continuous stream of refugees from other poorer African nations into South Africa is seen to contribute toward this. It is hard to obtain any hard data on the level of illegal immigrants in South Africa because this constitutes a significant part of the informal sector (this sector represents that part of the economy that is not monitored by government and therefore is not included in any gross national product figures or official government statistics, and is not taxed). With elevated unemployment levels amongst the poorer South Africans, many South Africans feel bitter toward the refugee immigrants who are seen to be taking away jobs from the poor. In this regard, there is little in the way of social security benefits payable to the unemployed in South Africa; thus, the unemployed survive with the help of family members and friends to provide meals and support, through begging on the streets, and/or stealing from others to support their existence.

Since the election of the ANC (African National Congress) Government in 1994, the political landscape has changed to the benefit of the non-white population – particularly for black South Africans. For example, significant government training funding has been allocated for the previously socially and economically disadvantaged. Entrepreneurship is one of the areas targeted whereby training programs have been developed to assist nascent entrepreneurs develop new businesses. This has been done in the hope of stimulating entrepreneurial activity that will lead to the generation of employment - even if only for the individual and/or their immediate family members.

Funding for the development and delivery of the training intervention that is the focus of this research came from the South African Government's Services SETA (Sector Education and Training Authority). The Services SETA also provided funds that formed the basis of a stipend paid to participants to encourage them to attend the training intervention. An independent organisation, The Entrepreneurship Incubator (Pty) Ltd, developed and administered the training intervention and collected the data about the program (refer Appendix 1). The researcher was independent of this organisation but was granted access to the data for analysis purposes.

## 4.0 Research Participants

Participants in the research were from Johannesburg and surrounding areas. All were black South Africans, were unemployed, and were socially and economically disadvantaged. Education levels ranged from post-high school diploma to undergraduate degree.

### 4.1 Participant Recruitment

Participants were recruited during Phase 1 of the project. Prospective participants were advised that, if they were successful in participating in the project, they would …

(1) Undertake a one-year training, mentoring, and business incubation program that would help them develop their business ideas to take advantage of business opportunities in the market that would help them develop sustainable businesses.

(2) Be paid a stipend for attending the program.

Participants were also told about the research being undertaken and that they would be asked to participate in the research on a voluntary basis. They were also advised that research participation would not prevent them from participating in the entrepreneurship training program. All who had registered for the training program agreed to participate in the research.

Participants were advised that they would need to complete a number of surveys and interviews as part of the project. Participants were provided with an Information Sheet about the project and were asked to complete a Consent Form if they agreed to participate (refer Appendix 2). The process of developing and delivering the Information Sheets and Consent Forms and data collection was managed by The Entrepreneurship Incubator (Pty) Ltd.

The recruitment process included the following activities: (1) Liaising with local community centres; (2) promoting the project via the print media; and (3) interviewing applicants. Members of the project steering committee were actively involved in all phases of the recruitment process.

(1) *Community centre liaison* was crucial to obtaining the support and formal consent of key people in the community. Appointments were made with key community centre individuals to discuss the project with them and to seek their support. A positive response was received from all individuals in these centres. With their endorsement and support, the project was widely promoted within the greater Johannesburg area via word-of-mouth, formal community meetings, information seminars, the distribution of pamphlets and local newsletters, and community radio. This led to the identification of, and access to, individuals in the various communities looking to establish businesses.

(2) In addition to promoting the project at a community level, a *widespread promotional campaign* was undertaken in the major newspapers. Over a six week period, advertisements appeared in a range of mainstream and local newspapers calling for individuals who were interested in starting businesses to register their interest.

(3) *All applicants were personally interviewed* over a six week period to gauge their levels of commitment and intention to starting businesses. Each interview was approx. 20-30 minutes. Steering committee members with assistants interviewed the applicants.

Over 1,100 applicants applied for participation in the program. Places were limited because of the limited resources available. These included the stipend that was paid to participants so long as they attended classes and actively participated in the Program. Lecture room facilities, business incubator space, and lecturer costs also were considerations. As a result of the selection process, 436 applicants were accepted onto the Program at Baseline - $T_1$.

It is acknowledged that there is a possibility that the individuals who participated in the program were different from those individuals that did not. Unfortunately, it was impossible to determine whether this was the case (Cohen and Cohen, 1983). Although many people have cellular phones in South Africa, there is a paucity of fixed telephone line subscribers – particularly in the less affluent areas. Thus, any telephone directory system from which to randomly select potential participants is unreliable. Given the target population of interest, the participant recruitment method adopted was the best approach given the limitations in accessing the population.

### 4.2 Participant Profile

Of the 436 participants selected, 329 participants stated that they intended to start businesses and 107 stated that they had no intention of starting businesses. Thus, participants were divided into two groups – those who said they would start businesses (this group was referred to as the "nascent entrepreneurs") and those who had no intention of starting businesses (this group was referred to as the "non-entrepreneurs").

Classification of participants as nascent entrepreneurs was consistent with the guidelines developed by McGee, Peterson, Mueller, and Sequeira (2009) in that the nascent entrepreneur participants were about to attend (at $T_1$) and did attend (between $T_1$ and $T_2$) a program on how to start a business, had learned about developing a business plan on the program (by $T_2$), and had worked on developing products or services that were the foundation for their businesses. In addition, these participants had identified themselves as wanting to start businesses.

Both nascent and non-entrepreneur groups participated in the program intervention between $T_1$ and $T_2$. The non-entrepreneurs were keen to participate in the program because they viewed their participation as helping to make them more employable. Participant descriptive statistics for the nascent entrepreneur and non-entrepreneur groups as at $T_1$ appear in Exhibits 3.1.1 to 3.1.4 and 3.2.1 to 3.2.4 respectively.

| Age | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 18 | 2 | .6 | .6 | .6 |
| 19 | 8 | 2.4 | 2.4 | 3.0 |
| 20 | 11 | 3.3 | 3.3 | 6.4 |
| 21 | 25 | 7.6 | 7.6 | 14.0 |
| 22 | 25 | 7.6 | 7.6 | 21.6 |
| 23 | 46 | 14.0 | 14.0 | 35.6 |
| 24 | 45 | 13.7 | 13.7 | 49.2 |
| 25 | 39 | 11.9 | 11.9 | 61.1 |
| 26 | 20 | 6.1 | 6.1 | 67.2 |
| 27 | 29 | 8.8 | 8.8 | 76.0 |
| 28 | 27 | 8.2 | 8.2 | 84.2 |
| 29 | 15 | 4.6 | 4.6 | 88.8 |
| 30 | 8 | 2.4 | 2.4 | 91.2 |
| 31 | 6 | 1.8 | 1.8 | 93.0 |
| 32 | 10 | 3.0 | 3.0 | 96.0 |
| 33 | 7 | 2.1 | 2.1 | 98.2 |
| 34 | 2 | .6 | .6 | 98.8 |
| 35 | 1 | .3 | .3 | 99.1 |
| 37 | 1 | .3 | .3 | 99.4 |
| 38 | 1 | .3 | .3 | 99.7 |
| 39 | 1 | .3 | .3 | 100.0 |
| **Total** | **329** | **100.0** | **100.0** | |

**Exhibit 3.2: Age Distribution of the *Nascent Entrepreneur* Group at $T_1$**

| Gender | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Females | 171 | 52.0 | 52.0 | 52.0 |
| Males | 158 | 48.0 | 48.0 | 100.0 |
| **Total** | **329** | **100.0** | **100.0** | |

**Exhibit 3.3: Gender Distribution of the *Nascent Entrepreneur* Group at $T_1$**

| Highest Education Level Achieved | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Primary | 1 | .3 | .3 | .3 |
| Secondary | 48 | 14.6 | 14.6 | 14.9 |
| Technical/Trade | 21 | 6.4 | 6.4 | 21.3 |
| Certificate | 86 | 26.1 | 26.1 | 47.4 |
| Diploma | 108 | 32.8 | 32.8 | 80.2 |
| UG Degree | 43 | 13.1 | 13.1 | 93.3 |
| PG Degree | 22 | 6.7 | 6.7 | 100.0 |
| **Total** | **329** | **100.0** | **100.0** | |

**Exhibit 3.4: Education Distribution of the *Nascent Entrepreneur* Group at $T_1$**

| Started a Business Previously | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 104 | 31.6 | 31.6 | 31.6 |
| No | 225 | 68.4 | 68.4 | 100.0 |
| **Total** | **329** | **100.0** | **100.0** | |

**Exhibit 3.5: Start-Up Experience Distribution of the *Nascent Entrepreneur* Group at $T_1$**

| Age | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 19 | 1 | .9 | .9 | .9 |
| | 20 | 4 | 3.7 | 3.7 | 4.7 |
| | 21 | 10 | 9.3 | 9.3 | 14.0 |
| | 22 | 13 | 12.1 | 12.1 | 26.2 |
| | 23 | 15 | 14.0 | 14.0 | 40.2 |
| | 24 | 19 | 17.8 | 17.8 | 57.9 |
| | 25 | 13 | 12.1 | 12.1 | 70.1 |
| | 26 | 13 | 12.1 | 12.1 | 82.2 |
| | 27 | 5 | 4.7 | 4.7 | 86.9 |
| | 28 | 2 | 1.9 | 1.9 | 88.8 |
| | 30 | 2 | 1.9 | 1.9 | 90.7 |
| | 31 | 1 | .9 | .9 | 91.6 |
| | 32 | 1 | .9 | .9 | 92.5 |
| | 33 | 1 | .9 | .9 | 93.5 |
| | 34 | 2 | 1.9 | 1.9 | 95.3 |
| | 37 | 1 | .9 | .9 | 96.3 |
| | 38 | 2 | 1.9 | 1.9 | 98.1 |
| | 40 | 1 | .9 | .9 | 99.1 |
| | 42 | 1 | .9 | .9 | 100.0 |
| | **Total** | **107** | **100.0** | **100.0** | |

**Exhibit 3.6: Age Distribution of the *Non-Entrepreneur* Group at $T_1$**

| Gender | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Female | 53 | 49.5 | 49.5 | 49.5 |
| Male | 54 | 50.5 | 50.5 | 100.0 |
| **Total** | **107** | **100.0** | **100.0** | |

**Exhibit 3.7: Gender Distribution of the *Non-Entrepreneur* Group at $T_1$**

| Highest Education Level Achieved | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Primary | 3 | 2.8 | 2.8 | 2.8 |
| Secondary | 37 | 34.6 | 34.6 | 37.4 |
| Technical/Trade | 3 | 2.8 | 2.8 | 40.2 |
| Certificate | 27 | 25.2 | 25.2 | 65.4 |
| Diploma | 34 | 31.8 | 31.8 | 97.2 |
| UG Degree | 1 | .9 | .9 | 98.1 |
| PG Degree | 2 | 1.9 | 1.9 | 100.0 |
| **Total** | **107** | **100.0** | **100.0** | |

**Exhibit 3.8: Education Distribution of the *Non-Entrepreneur* Group at $T_1$**

| Started a Business Previously | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 28 | 26.2 | 26.2 | 26.2 |
| No | 79 | 73.8 | 73.8 | 100.0 |
| **Total** | **107** | **100.0** | **100.0** | |

**Exhibit 3.9: Start-Up Experience Distribution of the *Non-Entrepreneur* Group at $T_1$**

At the end of the study, $T_3$, there were 287 (of the original 329) participants in the nascent entrepreneur group and 106 (of the original 107) participants in the non-entrepreneur group. Participant demographics for both groups as at $T_3$ appear in Exhibits 3.3.1 to 3.3.4 and 3.4.1 to 3.4.4 for the nascent and non-entrepreneur groups respectively. There appeared to be no systematic reason why participants in either group did not respond at $T_3$ except that the non-respondees were no longer at their recorded addresses. Because of the prevalence of HIV Aids in South Africa, it is possible that some of the participants may have died. In any event, there were no apparent differences in the profiles of the two groups between $T_1$ and $T_3$.

| Age @ $T_1$ | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 18 | 2 | .7 | .7 | .7 |
| 19 | 8 | 2.8 | 2.8 | 3.5 |
| 20 | 11 | 3.8 | 3.8 | 7.3 |
| 21 | 22 | 7.7 | 7.7 | 15.0 |
| 22 | 18 | 6.3 | 6.3 | 21.3 |
| 23 | 35 | 12.2 | 12.2 | 33.4 |
| 24 | 42 | 14.6 | 14.6 | 48.1 |
| 25 | 34 | 11.8 | 11.8 | 59.9 |
| 26 | 19 | 6.6 | 6.6 | 66.6 |
| 27 | 23 | 8.0 | 8.0 | 74.6 |
| 28 | 26 | 9.1 | 9.1 | 83.6 |
| 29 | 15 | 5.2 | 5.2 | 88.9 |
| 30 | 7 | 2.4 | 2.4 | 91.3 |
| 31 | 5 | 1.7 | 1.7 | 93.0 |
| 32 | 8 | 2.8 | 2.8 | 95.8 |
| 33 | 7 | 2.4 | 2.4 | 98.3 |
| 34 | 2 | .7 | .7 | 99.0 |
| 35 | 1 | .3 | .3 | 99.3 |
| 37 | 1 | .3 | .3 | 99.7 |
| 39 | 1 | .3 | .3 | 100.0 |
| **Total** | **287** | **100.0** | **100.0** | |

**Exhibit 3.10: Age Distribution of the *Nascent Entrepreneur* Group at $T_3$**

| Gender | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Female | 146 | 50.9 | 50.9 | 50.9 |
| Male | 141 | 49.1 | 49.1 | 100.0 |
| **Total** | **287** | **100.0** | **100.0** | |

**Exhibit 3.11: Gender Distribution of the *Nascent Entrepreneur* Group at $T_3$**

| Highest Education Level Achieved @ $T_1$ | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Primary | 1 | .3 | .3 | .3 |
| Secondary | 41 | 14.3 | 14.3 | 14.6 |
| Technical/Trade | 17 | 5.9 | 5.9 | 20.6 |
| Certificate | 75 | 26.1 | 26.1 | 46.7 |
| Diploma | 91 | 31.7 | 31.7 | 78.4 |
| UG Degree | 41 | 14.3 | 14.3 | 92.7 |
| PG Degree | 21 | 7.3 | 7.3 | 100.0 |
| **Total** | **287** | **100.0** | **100.0** | |

**Exhibit 3.12: Education Distribution of the *Nascent Entrepreneur* Group at $T_3$**

| Started a Business Previously @ $T_1$ | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 93 | 32.4 | 32.4 | 32.4 |
| No | 194 | 67.6 | 67.6 | 100.0 |
| **Total** | **287** | **100.0** | **100.0** | |

**Exhibit 3.13: Start-Up Experience of the *Nascent Entrepreneur* Group at $T_3$**

| Age @ $T_1$ | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 19 | 1 | .9 | .9 | .9 |
| | 20 | 4 | 3.8 | 3.8 | 4.7 |
| | 21 | 10 | 9.4 | 9.4 | 14.2 |
| | 22 | 13 | 12.3 | 12.3 | 26.4 |
| | 23 | 14 | 13.2 | 13.2 | 39.6 |
| | 24 | 19 | 17.9 | 17.9 | 57.5 |
| | 25 | 13 | 12.3 | 12.3 | 69.8 |
| | 26 | 13 | 12.3 | 12.3 | 82.1 |
| | 27 | 5 | 4.7 | 4.7 | 86.8 |
| | 28 | 2 | 1.9 | 1.9 | 88.7 |
| | 30 | 2 | 1.9 | 1.9 | 90.6 |
| | 31 | 1 | .9 | .9 | 91.5 |
| | 32 | 1 | .9 | .9 | 92.5 |
| | 33 | 1 | .9 | .9 | 93.4 |
| | 34 | 2 | 1.9 | 1.9 | 95.3 |
| | 37 | 1 | .9 | .9 | 96.2 |
| | 38 | 2 | 1.9 | 1.9 | 98.1 |
| | 40 | 1 | .9 | .9 | 99.1 |
| | 42 | 1 | .9 | .9 | 100.0 |
| | Total | 106 | 100.0 | 100.0 | |

**Exhibit 3.14: Age Distribution of the *Non-Entrepreneur* Group at $T_3$**

| Gender | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Female | 52 | 61.3 | 61.3 | 61.3 |
| Male | 54 | 38.7 | 38.7 | 100.0 |
| Total | 106 | 100.0 | 100.0 | |

**Exhibit 3.15: Gender Distribution of the *Non-Entrepreneur* Group at $T_3$**

| Highest Education Level Achieved @ $T_1$ | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Primary | 3 | 2.8 | 2.8 | 2.8 |
| Secondary | 37 | 34.9 | 34.9 | 37.7 |
| Technical/Trade | 3 | 2.8 | 2.8 | 40.6 |
| Certificate | 26 | 24.5 | 24.5 | 65.1 |
| Diploma | 34 | 32.1 | 32.1 | 97.2 |
| UG Degree | 1 | .9 | .9 | 98.1 |
| PG Degree | 2 | 1.9 | 1.9 | 100.0 |
| **Total** | **106** | **100.0** | **100.0** | |

**Exhibit 3.16: Education Distribution of the *Non-Entrepreneur* Group at $T_3$**

| Started a Business Previously @ $T_1$ | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Yes | 28 | 26.4 | 26.4 | 26.4 |
| No | 78 | 73.6 | 73.6 | 100.0 |
| **Total** | **106** | **100.0** | **100.0** | |

**Exhibit 3.17: Start-Up Experience of the *Non-Entrepreneur* Group at $T_3$**

# 5.0 The Training Intervention

> "There is an on-going debate in the entrepreneurship academy about whether we can actually teach students to be entrepreneurs. Its resolution is inextricably connected with our theoretical assumptions because they affect how and what we teach. … Those who advocate that entrepreneurship can be understood and taught to students assume that researchers will eventually develop a more general theory of entrepreneurship. Theory is an essential part of what we teach because we do not know any other way to help students anticipate the future, which is a key to entrepreneurial success, unless we counsel them to rely on luck or intuition." (Fiet, 2000a, p. 1)

## 5.1 About Entrepreneurship Teaching: Theory and Pedagogy

Teaching entrepreneurship involves including curriculum content from a variety of discipline areas. Except for the topic of discovery and/or idea generation, other topics taught in entrepreneurship courses are derived from other discipline areas; for example, entrepreneurial finance flows from the finance discipline; management of growth emanates from organisational theory (Fiet, 2000a). Although there is nothing wrong with this, Fiet (2000a) argues that entrepreneurship does not emphasise enough of a "distinctive domain" (p. 3) and that it is time for entrepreneurship educators to make their own contributions in terms of what they have learned about what entrepreneurs need to do to succeed. However, he stresses that it is important that this is conveyed in a manner whereby lecture content has theoretical underpinnings. He argues that many entrepreneurship teaching programs lack a theoretical basis and "focus excessively on describing entrepreneurial phenomenon rather than on developing theory to enable aspiring entrepreneurs to make predictions" (p. 2) and that many entrepreneurship textbooks contribute toward these shortcomings because they lack significant theoretical foundations. Thus, he argues that entrepreneurship educators must elevate the theoretical content in their courses if they hope to develop in students relevant cognitive skills that will help them make improved entrepreneurial decisions. In this regard, he recommends that educators adopt the following teaching approaches:

- Emphasise theory (but this can be "disguised" to make it interesting for students)
- Refrain from simply describing what entrepreneurs do, and
- Emphasise a deductive rather than an inductive approach in the teaching process so that students can understand how to apply theory deductively to their particular circumstances when they leave the classroom to set up their own businesses.

Although Fiet (2000a) appeals for more theoretical content, he acknowledges that his arguments are dependent upon several assumptions. These include the following …

- It is improbable that students will come across similar real-life situations to the anecdotal situations they use as a basis for learning in the classroom
- The entrepreneurial process can be theoretically explained (and taught)
- Students may be de-motivated if they feel that they will not meet the profile of a successful entrepreneur(s) studied in the classroom
- Since many firms fail, it appears illogical for students to study these types of firms
- Studying anecdotal "war stories" and/or "average profiles" of an entrepreneur will result in only average returns and/or "me too" type businesses and/or business strategies, and
- Studying successful entrepreneurs may have detrimental, unintended consequences and we may not fully appreciate what those consequences are (p. 2).

From a pedagogical perspective, in terms of teaching entrepreneurship theory to entrepreneurship students, he recognises that students may be bored if it is not presented in the best possible way, if the best teachers are not used to teach the theory, and if students are not taught how to apply the theory since students develop competencies through their practice with theory-based activities (Fiet, 2000b). Thus, Fiet (2000b) argues that the educator's focus needs to change from the teacher being the initiator of knowledge transfer to the student becoming engaged in the topic, wanting to practice more, and wanting to gain further relevant personal competencies to the extent that the student leaves the classroom wanting to become an entrepreneur.

## 5.2 Entrepreneurship Education *versus* Training

> "The difference (between training and education)? It's the difference between know how and know why. It's the difference between, say, being trained as a pilot to fly a plane and being educated as an aeronautical engineer and knowing why the plane flies, and then being able to improve its design so that it will fly better. Clearly both are necessary, so this is not putting down the Know-How person; if I am flying from here to there I want to be in the plane with a trained pilot (though if the pilot knows the Why as well, then all the better, particularly in an emergency).
>
> The difference, also, is fundamentally that Know How is learning to Think Other People's Thoughts, which indeed is also the first stage in education -- in contrast to learning to Think Your Own Thoughts, which is why Know Why is the final state of education. Indeed, both Know How and Know Why are essential at one moment or another, and they interact all the time; but at the same time, the center of gravity of education is and must be in the Know Why. For emphasis in Know How, go to a training college.
>
> And the further pay-off point is that when the educated student goes into a job, the ability to think one's own thoughts is also the source of flexibility so that, as the job requirements change or the job enlarges, the educated student is able to move with the changes. This should be a central issue with employers, but all too rarely is this the case. If only trained, then, if the job changes, the student has to be retrained.
>
> Are all students fit to be at the university? This is really not our question; if students can meet the standards and want to go to the university, that's their choice. But if a student tells me, in the middle of taking a core-required thermodynamics or fluid dynamics course, "Don't give me all that theoretical stuff; just give me the equation and tell me how to use it," then I know that the student wants to be trained, not educated."

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The Oxford Dictionaries (2012a) define *education* as "the process of receiving or giving systematic instruction, especially at a school or university … a body of knowledge acquired while being educated" and *training* as "the action of teaching a person or animal a particular skill or type of behaviour" (2012b). Thus, at a fundamental level, while entrepreneurship training can be thought of as the development of entrepreneurial skills and/or behaviours entrepreneurship education can be thought of as the development of a body of entrepreneurial knowledge.

Others have extended interpretations of the term, entrepreneurship education, and blurred the distinction between education and training. Hynes and Richardson (p. 734, 2007), for example, interpret entrepreneur education to be, "a key component and a means of equipping students with the knowledge, skills and competencies to exploit opportunities in this knowledge environment". They build upon Kourilsky's (2005) definition which involves teaching students how to recognise opportunities, acquire resources, manage risk, and establish business ventures. But entrepreneurship education does not necessarily need to focus only on business start-ups as it involves developing entrepreneurial attitudes and skills (Martin, 2004; Audretsch, 2002) and these can apply to the workplace to assist employees to be more enterprising and innovative (Matlay and Westhead, 2005). However, entrepreneurial attitudes and skills are not only relevant for business; they also are relevant for scientists and engineers (Hynes and Richardson, 2007a).

### 5.3 The Entrepreneurship Training Intervention Adopted in this Research

The entrepreneurship intervention adopted in this research involved a year-long program designed to impart knowledge to participants about how to start and develop businesses , recognise opportunities, and manage risk amongst other topics. Thus, there were educational aspects associated with the program; however, the program was practical and applied. Thus, although the intervention is referred to as a “training intervention”, it was a mix of education and training – though the practical training aspects dominated.

In developing the content of the program intervention, Fiet’s (2000a) call for entrepreneurship courses to be based on underlying theory was heeded. Pedagogical issues identified by Fiet (2000b) were incorporated into the training intervention and a systematic process was used to develop the entrepreneurship training content. Experienced trainers and educators were engaged to develop the one-year comprehensive program. Because the program was competency based, key competencies were identified that were considered essential for developing a sustainable innovative business. These were discussed with successful entrepreneurs in the first instance and then with experienced entrepreneurship educators. Relevant underlying theories were identified that provided the basis for providing theoretical support for the content developed and these theories were incorporated into the content. These were made attractive to students through demonstrating how the theories could be applied in practice. To this extent, consultants were employed to mentor participants and an incubator was established for participants to develop their businesses under the guidance of experienced entrepreneurial mentors. Because the program was to be a formal qualification in the South African Quality Assurance (SAQA) Framework (*Certificate IV in New Venture Creation*), additional standards were imposed that guided the quality assurance process in developing and delivering the program. Assessment was incorporated into the program including the need for participants to develop a formal business plan that articulated the entrepreneurial strategies they were going to employ to establish and develop their businesses.

### 5.4 Entrepreneurship Training and Mentoring Intervention Details

Between $T_1$ and $T_2$, participants were exposed to the entrepreneurship training and mentoring intervention program. The intervention program was developed as a *Certificate IV in New Venture Creation* and was registered as an accredited qualification with the relevant SAQA Authority for delivery by a South African registered training organisation. The intervention program was undertaken by a registered training organisation, (*The Entrepreneurship Incubator (Pty) Ltd*). The program was developed after consideration to what was contained in successful entrepreneurship training programs in Australia, New Zealand, Canada, and the UK. A comprehensive set of learning materials was developed for the participants. In addition to the "mainstream" entrepreneurship content of the program, a psychologist and counsellor were used in the program to deal with psychological problems being experienced by many participants as well as a motivational speaker whose job it was to maintain the drive and motivation of participants over the duration of the intervention. In addition, a board game was introduced that focused on key business concepts that demonstrated to participants why they needed to acquire particular business knowledge. To make it relevant for participants, this game also reflected situations relevant to (and prevalent in) life situations in Johannesburg. Thus, some aspects of the game focused on monies that could be made from legal entrepreneurial activities while other aspects focused on drug dealing and the sale of weapons but with resultant severe game penalties if caught. Other participants would sit in judgement on any game offenders who engaged in "illegal" money-making activities and who would meter out punishments accordingly. HIV Aids education also was another aspect of the game attempting to educate participants about safe sexual activity. The business game was seen as a key aspect of the program in motivating participants to learn about different aspects of starting and developing businesses. Participants embraced the game with a passion – and this provided an excellent entrée for them into learning about entrepreneurship in the classroom.

Mentors were also used on a one-on-one basis with participants. This allowed participants to receive individualised attention in helping them to interpret the lecture content in terms of their specific needs. In conjunction with the mentoring and training, business incubation facilities were made available to participants for them to incubate their business ideas. As a part of this process, business plans were required to be submitted at the end of the one year intervention.

## 6.0 Questionnaire

A questionnaire was used in the main study. Since the unit of analysis was the individual, the use of a questionnaire to collect the data required had the advantage of accessing a large number of participants simultaneously, was relatively inexpensive, and was less time-consuming in terms of data collection and analysis than other forms of data collection (such as structured interviews) (Neuman, 2005).

The questionnaire was developed using a range of scales that had been validated in other international studies. To ensure the scales were appropriate for the research context (for example, that there were no cultural differences in understanding the terminology used in the scales), the scales were successfully piloted with seven participants from the target population prior to the commencement of the study (see, for example, Neuman, 2005). No modifications to the questionnaire were necessary as a result of feedback received from the pilot.

In the main study, the questionnaires were hand delivered to participants who completed them whilst the data collection team remained at the front of the room. This meant that if participants had any questions, they could be clarified immediately.

The questionnaire comprised a number of sections. These sections included demographic information about the participants (gender, education, age, etc.), participant start-up intentions, start-up behaviour (at $T_3$), and sections that contained scales to measure the constructs of interest in this study (personal values and entrepreneurial attitude). The questionnaire appears in Appendix 3.

The questionnaire was given to participants to complete at $T_1$, $T_2$, and $T_3$. All participants in the program completed the questionnaire at $T_1$ and $T_2$ (n = 329 nascent entrepreneurs and 107 non-entrepreneurs at $T_1$). Only those participants that could be located completed the questionnaire at $T_3$ (n = 287 nascent entrepreneurs and 106 non-entrepreneurs).

## 7.0 Measures

The hypothesised structural relationships among the constructs appearing in the structural model reflect the multi-dimensional nature of the research questions asked. The underlying complexity requires the specification and development of appropriate measurement models that effectively and validly measure the model constructs and their inter-relationships (Churchill, 1979). In this regard, one needs to be concerned with model mis-specification. Thus, due attention was paid to specifying the appropriate item measures that captured the underlying factor structures to reflect the relevant constructs (Churchill, 1979, Jarvis, MacKenzie, and Podsakoff, 2003). This involved a thorough review of the literature to ensure that the construct measures used, and their underlying measurement items, met relevant internal validity and content validity criteria.

Valid scales used in a range of prior studies by other researchers were used to measure the constructs of interest in this study. The scales chosen (discussed below) have been found to have good psychometric properties and were chosen for comparability and reliability reasons.

### 7.1 Values

*Values* appear as an exogenous latent variable in the structural model. A review of relevant business and marketing journals resulted in three values frameworks (or variants of these) dominating the literature – Rokeach (1973), Kahle (1983), and Schwartz and Bilsky (1987). The most widespread adopted approach over the last 25 years was Kahle's (1983) List of Values (LOV). LOV has been preferred for its parsimony (it has only nine questions) and its well-established psychometric properties (Kahle, 1983). For these reasons, values were measured in this research using the LOV instrument (Kahle, 1983; Kahle, Beatty, and Homer, 1986) that uses a Likert-type scale (1 = Important to Me and 9 = Extremely Important to Me).

Various studies have demonstrated that, through factor analysis, the nine LOV questions (usually) can be reduced to three dimensions (e.g., Homer and Kahle, 1988). Various names have been attributed to these three dimensions including internal values, external values, and interpersonal values (Homer and Kahle, 1988). Kamakura and Novak (1992) also identified three underlying values dimensions similar, but not identical to, Homer and Kahle (1988) which they labelled empathy, achievement, and hedonism. In this research, Homer and Kahle's (1988) terminology is used to identify the underlying personal values dimensions (internal, external, and interpersonal values).

LOV internal values comprise self-fulfillment, self-respect, and sense of accomplishment. They are validated internally and do not require the real or imagined presence of others (Kropp, Lavack, and Silvera, 2005). LOV external values comprise a sense of belonging, being-well respected, warm relationships with others, and security. They typically require the judgments, opinions, and/or presence of others (Kahle, 1983). LOV interpersonal values (fun and enjoyment in life and excitement) are interactional and they combine aspects of both internal and external values (Kahle, 1983).

### 7.2 Entrepreneurial Attitude

A scale developed by McCline, Bhat, and Baj (2000) was used to measure the latent endogenous variable, *entrepreneurial attitude*. McCline, Bhat, and Baj's (2000) research was an extension of Robinson, Stimpson, Heufner, and, Hunt's (1991) validated scale that measures entrepreneurial attitude orientation (EAO). Both of these scales have been successful to various degrees in discriminating between entrepreneurs and non-entrepreneurs. The EOR scale differs from the EAO scale by including opportunity recognition measures that are now "prominent in the literature but were not part of the original EAO scale" (McCline, Bhat, and Baj, 2000, p. 83).

McCline, Bhat, and Baj (2000) identified the EOR scale to be more parsimonious in predicting entrepreneurial attitude and differentiating entrepreneurs from non-entrepreneurs than Robinson, Stimpson, Huefner, and Hunt's (1991) EAO scale although they acknowledge that the EOR scale could be used in conjunction with Robinson, Stimpson, Huefner, and Hunt's (1991) EAO achievement and perceived personal control subscales. For parsimony, this research uses the McCline, Bhat, and Baj (2000) EOR scale.

The EOR scale uses a 10-point Likert type scale that ranges from "1 = Strongly Disagree" to "10 = Strongly Agree". The instrument uses a tripartite approach to measure attitude with questions developed for cognitive, affective, and behaviour EOR. Examples of scale questions include "I like talking to people to find out how I can provide better services." and "I believe I can identify what a customer needs to make them satisfied".

### 7.3 Entrepreneurial Intention

*Entrepreneurial intention* appears as an endogenous variable in the structural model and is hypothesised to be directly influenced by entrepreneurial attitude (Ajzen, 1985). Participants were asked whether they intended to actually start a business within the foreseeable future. The answer to this question was a simple "Yes" or "No". This question was used to divide the sample into two groups … those who intended starting businesses (this group was labelled "nascent entrepreneurs") and those who had no intention of starting a business (this group was labelled "non-entrepreneurs"). It was used only as a categorizing variable (to determine whether participants should be labelled "nascent" or "non-entrepreneurs"). The results of this question were only used in the moderating variable hypothesis analyses of the data (refer Chapter 5) where tests were undertaken to determine whether group membership (nascent or non-entrepreneur) had an effect on the model inter-relationships.

A second question, however, was also asked about participants' intentions to start a business. Whereas the first intention question was dichotomous (Yes/No), the second question used a 7-point Likert scale (Ajzen, 1991) ranging from "1 = Extremely Unlikely" to "7 = Extremely Likely" to determine how likely it would be that a participant would start a business in the foreseeable future. This question was used in the structural modeling analysis of the data and is reflected in the model. It is similar to the first listed of the following four items used by Zhao, Seibert, and Hills (2005) in their study of entrepreneurial intentions - starting a business; acquiring a small business; starting and building a high-growth business, and acquiring and building a company into a high-growth business. As a final point, Linan and Chen (2009) developed a six item scale to measure entrepreneurial intentions that is pertinent to this research; however, their scale was not available when this research commenced and so could not be incorporated into this research.

### 7.4 Business Start-Up Behaviour

Business start-up behaviour follows from entrepreneurial intentions. Participants were asked two questions about their start-up behaviour. In the first question, participants were asked a simple dichotomous "Yes/No" question in terms of "Have you started a business since the program started". This question was asked to determine what participants thought about their progress – but was not used in the data analysis as it was considered that business start-up is not necessarily "black or white".

The question used in the data analysis for determining business start-up behaviour was measured using a 7-point Likert scale where a "1 = completely unoperational" and a "7 = completely operational". Participants were asked "To what extent have you started a business since starting the program? (where a "1" means you have not started a business at all; "7" means that your business is fully operational, and numbers rated in between (that is, the "2" to "6" range) provide insights into how operational your business is at this point in time – to what extent it is partially operating or not)?".

## 8.0 Data Analysis Process

The data analysis process commenced with entry of the data recorded by the participants on the questionnaires provided to them. This was entered into an Excel 2007 Spreadsheet Template specifically designed to capture the data. The data was then uploaded into PASW (previously called "SPSS"). The data was then prepared for the main analyses using PASW Version 18.0.2. PASW was then used for undertaking various preliminary analyses and preparing the data for the main analysis. Structural equation modeling (SEM) (Jöreskog, 1970, 1973) was used for the primary data analysis (see, for example, Kaplan, 2009). The following steps were followed in the entry, preparation, and analysis of the data:

**Data Entry**

- Data coding and entry (Excel and then uploaded to PASW)

**Data Preparation**

- Dealing with missing data (PASW)

**Data Analysis**

- Descriptive statistics (PASW)
- Calculation of reliabilities (PASW)
- T-Test calculations (Paired Samples and Independent Samples)
- Checking for outliers and non-normality (AMOS)
- Confirmatory Factor Analysis (AMOS)
- Discriminant Analysis (AMOS)
- Invariance testing (AMOS)

- Developing composite scores (AMOS, Excel, and PASW)
- Analysis of the full structural model (AMOS)
- Testing of group membership as a moderating variable (AMOS)

A discussion of reliability and validity issues follows as well as an overview of the structural equation modeling approach adopted in this research.

## 8.1 Reliability Issues

Reliabilities were calculated for the values and entrepreneurial attitude scales used in this research. Reliability involves assessing the level of consistency among multiple measurements of a variable (Hair, Black, Babin, and Anderson, 2009). Two forms of reliability were calculated in this research: Internal construct consistency (using Cronbach Alpha and Coefficient H) and Test-Retest (Hair, Black, Babin, and Anderson, 2009).

**Internal Consistency**: This applies to the consistency among the items within a scale. The basis for this form of reliability is that all the items in a scale should be measuring the same construct and thus be considerably inter-correlated. Cronbach's Alpha and Coefficient H were two measures of reliability calculated in this research.

*Cronbach's Alpha* (Nunally, 1979; Peter, 1979) provides a lower bound estimate of the true reliability of a construct. It is the most widely used measure of internal consistency (Robinson, Shaver, and Wrightsman, 1991; Robinson and Shaver, 1973). ). The generally accepted lower limit of Cronbach's Alpha is 0.70 (although 0.60 to 0.69 is acceptable in exploratory research) (Hair, Black, Babin, and Anderson, 2009). Cronbach's Alpha is influenced by the number of items in a scale (the more items the more likely a higher reliability result will be achieved). Thus, more stringent requirements must be placed on scales that have a higher number of items (Hair, Black, Babin, and Anderson, 2009).

Although there are a number of reliability measures available (e.g., Werts, Rock, Linn, and Jöreskog, 1978) including Cronbach's Alpha, Hancock and Mueller's (2001) *Coefficient H* was used in this research since it maximises the reliability of congeneric (Jöreskog, 1971) measures. In *congeneric models*, there are unequal factor loadings and unequal measurement errors (thus, indicator variables may contribute to a factor in varying degree) whereas in *parallel models* (Lord and Novick, 1968) the factor loadings and measurement errors are equal (each measurement is treated as an equally accurate indicator of the true score and the errors of measurement are assumed to have the same variance). In this research, it is assumed that the constructs of interest (values and entrepreneurial attitude) are congeneric since there is no underlying theoretical reason why they should be equal. When Cronbach's Alpha is used to evaluate reliability in a congeneric model, it provides only a lower bound estimate of the true reliability. Coefficient H provides a more indicative assessment of reliability. In this research, while Cronbach's Alpha is calculated for the scales, so too was Coefficient H. Coefficient H reliability measures were used in calculating the entrepreneurial attitude factor loading and error variance composite scores in the complete structural model.

**Test-Retest**: This involves assessing the consistency of responses between two points in time. The aim is to assess whether the responses are not too varied between the two points. This indicates that the measurement taken at a point in time is reliable. Since the research design adopted in this research was repeated measures longitudinal with three points of data collection, the Test-Retest approach was possible. However, with the introduction of the one year entrepreneurship training intervention program into the design, it was expected that, with the exception of values (which are hypothesised to remain stable), there may be changes in responses over time as a result of the intervention.

### 8.2 Validity Issues

Although internationally validated scales were used in this research, SEM techniques were used to examine convergent and construct validity of the constructs of interest (values and entrepreneurial attitudes). *Convergent validity* measures the direct relationship between an observed variable and a latent construct. Convergent validity is achieved when the factor loading is significantly different from zero. A standardised loading of greater than 0.70 corresponds to an item reliability of approximately 0.50 (0.49); however, the factor loading does not need to be greater than 0.70 to achieve convergent validity. The key criterion is that the estimated parameter is significantly different from zero (Holmes-Smith, 2010).

*Construct validity* measures whether there is a good representation of the variable that the researcher intends to measure. For a one-factor congeneric measurement model to be acceptable, the question item indicator variables must all be valid measures of the related latent construct. In this regard, the SEM "goodness-of-fit" measures (as appear in the AMOS output) provide insight into construct validity. If they are within the relevant range, then construct validity can be confirmed (Holmes-Smith, 2010).

### 8.3 About the Structural Equation Modeling (SEM) Applied in this Research

Structural Equation Modeling (SEM) is "a class of methodologies that seeks to represent hypotheses about summary statistics derived from empirical measurements in terms of a smaller number of 'structural' parameters defined by a hypothesized underlying model" (Kaplan, 2009, p. 1). That is, it adopts a confirmatory approach to the analysis of a structural theory associated with a particular phenomenon (Byrne, 2001).

SEM represents a simultaneous combination of two statistical approaches - factor analysis and path analysis - into a single all-inclusive statistical methodology (Kaplan, 2009). The typical approach to SEM typically involves the following …

> "First, when available, a theory is presented. The structural equations, as represented in a path diagram, are seen as a one-to-one representation of the theory. Next, a sample is selected and measures are obtained on the sample. This is followed by the estimation of the parameters of the model. At this stage, the measurement model can be estimated first, followed by the structural model or the full model can be estimated at once. This is followed by an assessment of the goodness-of-fit of the model followed by model modification if necessary. Typically this stage is cyclical with the model continually being modified and evaluated in terms of goodness-of-fit until a decision is made that the model meets some standard of adequate fit." (Kaplan, 2009, p. 8).

This approach was used in this research. There was established existing theory underpinning the areas of values and attitude, and this theory was used as the basis for formulating the model. Thus, the existing theory could be presented in terms of a structural model. SEM was used to build upon and extend the existing theory by analysing the hypothesised model relationships.

SEM has several advantages over "traditional" procedures (Byrne, 2001). First, it lends itself to data analysis for inferential purposes. Second, whereas traditional multivariate procedures are unable to assess or correct for measurement error, SEM provides explicit estimates of error variance parameters. Thus, using traditional methods when there is error in the explanatory variables may lead to serious result inaccuracies. SEM overcomes this problem. Third, whereas traditional methods are founded upon observed measurements only, SEM can incorporate both observed and unobserved (latent) variables. Fourth, there are few easily applied alternate methods to SEM for modeling multivariate relationships and/or for estimating point and/or interval indirect effects. Because of the nature of the design and the nature of the variables of interest in this research, SEM was the preferred approach to analysing the data.

The SEM package used in analysing the data in this research was AMOS Version 18.0.02 (Arbuckle, 2008). This was used in undertaking the analyses of the individual and combined measurement models and the complete structural model (including the composite model).

### 8.3.1 Data Normality

An important assumption underlying structural equation modeling is that the observations are drawn from a continuous and multivariate normal population. In reality, however, most data fails to meet the underlying assumption of multivariate normality (West, Finch, and Curran, 1995). If the sample data is not multivariate normal, then the Chi-square statistic for overall model fit will be inflated and the standard errors used to test the significance of the individual parameter estimates will be deflated (Cunningham, 2010; West, Finch, and Curran, 1995). From a practical perspective, this can result in two outcomes: (1) The Chi-square statistic will not make an accurate assessment of fit – this may result in model rejection when a model should have been accepted; and (2) The test of parameter estimates may be biased resulting in too many significant results (Anderson and Gerbing, 1988).

To assess data normality, we evaluate data skewness and kurtosis. *Skewness* is associated with the symmetry of a distribution whereby the bulk of the data scores appear to the left (positively skewed where most of the scores are below the mean) or right (negatively skewed where most of the scores are above the mean) of the distribution rather than in the middle (normally distributed). Skewness values will be zero when the data is normally distributed. The further the skewness statistic is away from zero, the greater the skewness in the distribution (West, Finch, and Curran, 1995). There are indications of excessive non-normal data when absolute values measures of skewness exceed 2.0 (West, Finch, and Curran, 1995) though Kline (2005) suggests a skewness index in excess of 3.0 is indicative of an extremely skewed distribution.

*Kurtosis* is associated with the "peakedness" of a distribution and is a gauge of the degree to which scores group together (referred to as positive kurtosis or a leptokurtic distribution where there is a high peak and a "heavy" tail) or are broadly dispersed (referred to as negative kurtosis or a platykurtic distribution where there is the opposite) (Cunningham, 2008, p.6-18; Kline, 2005). Kurtosis can be particularly problematic in SEM (Bollen and Stine, 1993; West, Finch, and Curran, 1995) –particularly where there is multivariate kurtosis – since it can have a significant effect on the standard errors (and thus significance tests) when maximum likelihood estimation is adopted in confirmatory factory analysis (Browne, 1982).

There are indications of excessive non-normal data when absolute values measures of kurtosis exceed 7.0 (West, Finch, and Curran, 1995). Kline (2005) states that values with a standardised kurtosis index in a normal distribution is 3.0 and that values exceeding 3.0 indicate positive kurtosis and those less than 3.0 indicate negative kurtosis. He acknowledges that kurtosis values ranging from 8.0 to 20.0 should be regarded as indicating extreme kurtosis and that as a rough rule of thumb, "… absolute values of the kurtosis index greater than 10.0 may suggest a problem and values greater than 20.0 may indicate a more serious one" (p. 50) (see, also, DeCarlo, 1997).

Mardia's coefficient for multivariate kurtosis (Mardia, 1970, 1974) is a statistic produced in AMOS that allows the researcher to test for multivariate normality. When a data distribution is multivariate normal, Mardia's coefficient has an anticipated value of zero (some statistical programs, such as AMOS, subtract 3.0 from the kurtosis index of 3.0 before producing its value). Although there is no absolute level for Mardia's coefficient to indicate multivariate non-normality, values of three or greater suggest there may be a non-normality problem (Wothke, 1996). Mardia's coefficient is also directly related to Mahalanobis distances. Thus, large Mardia coefficient values suggest "outliers" may be present in the data (DeCarlo, 1997).[6]

To deal with non-normal data, Satorra and Bentler (1988) developed the Satorra-Bentler Chi-square. This corrects the normal Chi-square statistic that is generated when maximum likelihood is used. The Satorra-Bentler Chi-square is generally regarded as one of the finest alternative test statistics when there are problems with non-normality (Hu, Bentler, and Kano, 1992; Chou, Bentler, and Satorra, 1991; Curran, West, and Finch, 1996).

The Satorra-Bentler Chi-square, however, is not calculated in AMOS. Instead, AMOS produces the Bollen-Stine bootstrap p (Bollen and Stine, 1993) to account for non-normality and to produce appropriate standard errors through it bootstrapping routines.[7] The Bollen-Stine bootstrap p is a post hoc non-normality adjustment to calculate an adjusted Chi-square goodness-of-fit statistic. A model is typically rejected if the Bollen-Stine $p < 0.05$.

### 8.3.2 Stages in the SEM Process

There are a number of stages in the structural equation modeling process (see, for example, Kline, 1998; Diamantopoulos and Siguaw, 2000):

- **Model Conceptualisation**: Development of a theory about a set of variables including their inter-relationships and, if some variables are latent variables, then what are the indicator variables that measure each of the latent variables.
- **Path Diagram Construction and Model Specification**: Based on the theory and the educated opinion of the researcher, what are the inter-relationships amongst the latent variables and how can these best be measured?

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[6] Outliers are scores that are quite different from the rest. Univariate outliers are those that have "extreme" scores on a single variable – usually more than three standard deviations from the mean. Multivariate outliers are those that have "… extreme scores on two or more variables , or its pattern of scores is atypical" (Kline, 2005, p.51). A statistic for measuring outliers is the Mahalanobis distance statistic. This "indicates the distance in standard deviation units between a set of scores (vector) for an individual case and the sample means for all variables (centroids)" Kline, 2005, p. 51).

[7] Bootstrapping is a procedure to deal with multivariate non-normality (West, Finch, and Curran, 1995; Yung and Bentler, 1996) by enabling a researcher to generate multiple subsamples from an original database. The number of bootstrap samples generated is typically between 1,000 to 2,000 (Cunningham, 2008).

- **Model Identification**: This involves assessing whether the parameters to be estimated can be measured. This means that there must be enough information in the sample data to be able to estimate all of the parameters specified by the hypotheses in the conceptual model.

- **Parameter Estimation**: There needs to be at least enough, if not more, information in the sample data to estimate the parameters. An iterative estimation procedure is used to estimate an approximate value for each parameter that has greater than one possible solution. These iterative procedures need to converge on a set of parameter estimates.

- **Assessment of Model Fit**: Assessment is made of the model to determine if the model fits the data. This involves examining the differences between the sample variances and covariances and the implied variances and covariances derived from the parameter estimates. If the difference is small, then the model fit is assessed as "good".

- **Model Re-Specification**: A model is correctly specified when there is a "good" reproduction of the sample covariance. This equates to the question of whether the hypothesised model is a good representation of the "true" model of the phenomena being examined. If the hypothesised model is inconsistent with the true model, then it is mis-specified. In this situation, the covariance matrix will be reproduced poorly. Model mis-specification can occur through omitting and/or including variables and parameters that should/should not have been included. When a model is mis-specified, there is the opportunity to re-specify the model to improve model fit (see, for example, Schumacher and Lomax, 1996). AMOS (and other SEM packages such as Mplus) provides a set of model fit indices that suggest how the model may be improved; however, any changes to the model should only be undertaken within a theoretical context. Model changes should not be "data-driven".

- **Model Cross Validation**: Model validation occurs when the model is fitted to a new sample of data to test whether the solutions obtained are based on chance relationships not present in other samples. Model validation can occur through (1) dividing the original sample into calibration and validation sub-samples (if the original sample is large enough) or (2) collecting an additional sample(s) with the original sample being used for calibration and the subsequent sample being used for model validation.

### 8.3.3 Confirmatory Factor Analyses of the Measurement Models

When studies consist of multiple latent variables, it is important that the constructs differ sufficiently from each other. It is also important that the observed variables are reflective indicators of the construct that they are supposed to relate to. To address these issues, a Confirmatory Factor Analysis (CFA) is undertaken of the measurement models. CFA is appropriate when there are clearly defined hypotheses about the precise relationships between observed variables and their respective latent constructs. CFA is usually the first step in the data analysis process (Jöreskog, 1993).

CFA tests the validity of representing a latent construct by the hypothesised number of measurement items or indicator variables. When the data does not support the model, the model is rejected or may be re-specified on the basis of underlying theory. The primary aims of CFA are to identify whether identified item indicators uniquely represent the relevant construct that they are hypothesised to represent and whether the model constructs/latent variables are theoretically and statistically distinct. Thus, a CFA model provides convergent and discriminant validity of the identified measures (Anderson and Gerbring, 1988).

Jöreskog (1993) recommends one of two approaches in the analysis of data: either a strictly confirmatory approach or a model generating model approach. With the *strictly confirmatory approach*, the researcher formulates a model, obtains data to test it, and the model is either accepted or rejected. Although the confirmatory approach provides the strongest test of a measurement model, in practice, such a test may not be practical. The *model generating model approach* allows the researcher to specify a tentative full model developed around theory. However, before the full model is tested, a series of one factor congeneric model tests (see below for an explanation of the term “congeneric”) are undertaken for each construct that has four or more indicator items (with less than four indicator items, there are insufficient degrees of freedom to perform the analysis on the individual construct). Those constructs that have less than four indicator items can be paired and tested together. If the Chi-square is unsatisfactory, modifications are made to the model in accordance with the underlying theory. Once the measurement models for the individual constructs have been tested individually, they are then combined into a full measurement model and tested as a whole. This approach was adopted in this research. Following is an explanation of congeneric models and the one factor congeneric model analyses undertaken in this research.

### 8.3.4 One-Factor Congeneric Measurement Models

Whereas *parallel models* (Lord and Novick, 1968) assume that the measurement of each item is treated as an equally accurate indicator of the "true" latent variable of interest with the measurement errors assumed to have the same variance, congeneric models assume a different structure. With *congeneric models* (Jöreskog, 1971), the indicator variables associated with any one factor are assumed to reflect the same generic true score; however, it is assumed that the indicator variables may each contribute to the factor in differing levels (that is, that the regression coefficients (factor loadings) are not the same) and that the error variances differ. Congeneric measurement models are assumed in this research since nothing exists in the theory associated with the constructs of interest (values and entrepreneurial attitudes) to suggest that the indicator variables contribute equally to each of the particular constructs of interest and that the error variances are the same.

One-factor congeneric measurement models are the simplest type of measurement model. These models characterise the regression of a set of observed indicator variables on a particular associated latent variable. Using a structural equation modeling program such as AMOS, the regression coefficients, factor variance, and error variances of the measurement items can be estimated.

Good fitting one-factor congeneric models have indicator variables of an identical type that contribute to the overall measurement of the latent variable. In other words, the indicator variables must all represent the same generic true score (they must all be valid measures of the one latent trait they purport to measure). As such, the goodness-of-fit statistics can be seen as confirming *construct validity*; that is, that the hypothesised indicators actually measure the latent variable construct of interest (Kline, 2005). C*onvergent validity* (a measure of the magnitude of the direct structural relationship between an observed variable and a latent construct) is achieved when the factor loadings (regression coefficients) are significantly different from zero.

### 8.3.5 Assessing Model Fit

In the SEM phase of data analysis, a series of goodness of fit measures are undertaken to assess the fit of the data against the model. These include the Chi-square statistic ($\chi^2$), Root Mean-Square Error of Approximation (RMSEA), Standardised Root-Mean-square Residual (SRMR), Tucker-Lewis Index (TLI) – also called the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI).

AMOS calculates all the goodness-of-fit indices mentioned. It also calculates two other fit indices – the Goodness-of-Fit Index (GFI), and Adjusted Goodness-of-Fit Index (AGFI).

However, these fit indices are influenced by sample size and some scholars suggest that these statistics are not necessarily reliable. For example, Mplus does not calculate the GFI or the AGFI (Muthen and Muthen, 1998). A brief discussion of the indices appears below identifying the relevant "cut-off" values/range that should be attained for the model to be seen as a good fit of the data; that is, in achieving "Model Fit".

Achieving model fit means achieving the best set of parameter estimates that minimises the discrepancy between the matrix of implied variances and covariances compared with the matrix of sample variances and covariances. If the specified model is a reasonable representation of the data, then the discrepancies will be small. When the model is correctly specified, one or more of the following goodness-of-fit indices will be in the relevant range specified below. The greater the number of fit indices that exceed the relevant cut-off values, the increased likelihood that the model is correctly specified.

- **Chi-Square ($\chi^2$):** With SEM, the $\chi^2$ statistic tests whether the matrix of implied variances and covariances is significantly different than the matrix of sample variances and covariances. Thus, whereas in "traditional" analyses, the researcher is looking for a significant $\chi^2$, in SEM, model fit is indicated when $\chi^2$ is non-significant ($p>0.05$). Thus, the $\chi^2$ statistic tests whether the specified model exactly fits the data. However, where the data is non-normal, then the p-value should be adjusted to reflect non-normality before assessing fit. AMOS uses the Bollen-Stein Bootstrap p-value to do this (Bollen and Stine, 1993) whereas in Mplus (and LISREL), the Satorra-Bentler $\chi^2$ (Satorra and Bentler, 1994) statistic is calculated. Both the Bollen-Stein p-value and the Satorra-Bentler $\chi^2$ should have a p-value greater than 0.05.

  *Summary of Acceptable Level that suggests Model Fit:* The p-value should be greater than 0.05 for multivariate normally distributed data. If the data is non-normal, then before assessing model fit, the Bollen-Stine p (AMOS) or the Satorra-Bentler (Mplus and LISREL) need to be calculated. These also should be greater than 0.05.

- **Root Mean-Square Error of Approximation (RMSEA):** RMSEA takes into account the error of approximation in the population and loosens up the rigorous requirement on $\chi^2$ that the model holds precisely in the population of interest. Based on simulation studies, it is suggested that RMSEA performs less optimally when $n<200$ (Chen, Curran, Bollen, Kirby, and Paxton, 2008). A RMSEA of 0.05 or less indicates a close fit (though not necessarily an exact fit) and that the model is acceptable (Browne and Cudeck, 1993). (Note, however, that Hu and Bentler (1998) recommend a cut-off of 0.06.) Browne and Cudeck (1993) also suggest undertaking a test of the hypothesis that RMSEA ≤ 0.05. This is called PCLOSE. PCLOSE is a p-value that indicates "close fit" of the model to the data. This differs from the $\chi^2$ statistic that tests the hypothesis that RMSEA = 0; that is, that there is exact fit. If PCLOSE > 0.05, then we accept that the specified model closely fits the data; otherwise, we assume that the model is not a good representation of the data. If the 90% confidence interval on the population value of RMSEA = 0, then we can say that there is exact fit.

*Summary of Acceptable Level that suggests Model Fit:* RMSEA should (ideally) be less than 0.05 and PCLOSE should be greater than 0.05 to accept the test for close fit. If Lower 90% (LO 90) = 0, then the test of exact model fit is supported. If the confidence interval around RMSEA is entirely greater than 0.5, then the null hypothesis that the model has close fit (that is, that RMSEA ≤ 0.5) is rejected (Browne and Cudeck, 1993).

- **Standardised Root Mean-square Residual (SRMR):** The Root Mean-square residual (RMR) is a measure of the average residual differences between the matrix of implied and matrix of sample variances and covariances. The size of RMR, however, can be affected significantly by the order of magnitude of the scales of the observed variables. Thus, the preferred statistic is the *standardised* RMR (SRMR). Ideally, this should be less than 0.06 (Hu and Bentler, 1998). An SRMR greater than 0.06 could be indicative of outliers in the data (Holmes-Smith, 2010).

  *Summary of Acceptable Level that suggests Model Fit:* SRMR should be less than 0.06. A large SRMR suggests outliers in the data.

- **Goodness-of-Fit Index (GFI) and Adjusted Goodness-of-Fit Index (AGFI):** The GFI is a measure of the relative amount of sample variance and covariance that is jointly explained by the implied variance and covariance (Byrne 2001). For a well-fitting model, the GFI (Jöreskog and Sörbom, 1984) will approach a value of 1.00. The AGFI is similar to the GFI except that it takes into consideration the degrees of freedom in the specified model. Both GFI and AGFI are "absolute" indices in that they compare the hypothesised model with no model at all (Hu and Bentler, 1995). Both indices range from zero to 1.00 with values close to 1.00 indicating a close fit.

  *Summary of Acceptable Level that suggests Model Fit:* Both GFI and AGFI should be greater than 0.95. However, note that a number of researchers (including Hu and

Bentler (1998) recommend not using either the GFI or the AGFI because both indices have demonstrated inconsistent sensitivity to model specification and are affected by sample size.

- **Tucker-Lewis Index (TLI) (somewhat equivalent to the Non-Normed Fit Index (NNFI)):** The TLI (Tucker and Lewis, 1973) is an *incremental* fit index that is derived from a comparison between the hypothesised model and the independence model. Its value can exceed 1.00. When TLI > 1.00, this suggests that the specified "model may be over-specified (that is, that too many parameters have been freed to be estimated) indicating that the model is less than parsimonious" (Holmes-Smith, 2010, p. 5.5). Hu and Bentler (1999) recommend a cut-off value of close to 0.95.

  *Summary of Acceptable Level that suggests Model Fit:* TLI should be greater than 0.95 with values greater than 1.0 suggesting lack of parsimony.

- **Comparative Fit Index (CFI):** The NNFI has demonstrated a tendency to underestimate fit in small samples (Byrne, 2001). As such, Bentler (1990) modified the NNFI to take sample size into account and thus proposed the CFI. The CFI is an incremental fit index similar to the TLI except that it is constrained to falling between 0 and 1.00.

  *Summary of Acceptable Level that suggests Model Fit:* CFI should be greater than 0.95.

### 8.3.6 Discriminant Validity

Discriminant validity is defined as the extent to which two or more constructs of interest are statistically different from each other. Large correlations between latent constructs (larger than 0.85) suggests poor discriminant validity (Kline, 2005). Confirmatory factor analysis (CFA) can be used to estimate discriminant validity. Thompson (1997) recommends using the pattern and structure coefficients of latent constructs to determine whether their respective measurement models are empirically distinct. The pattern coefficients are the standardised factor loadings appearing in the AMOS output. The structure coefficients, however, need to be calculated. This is done by multiplying the latent factor correlation by the factor loadings for each of the associated items. In this research, discriminant validity was assessed using Thompson's (1997) approach.

### 8.3.7 Sample Size Issues

The issue of how large should the sample be in SEM has occupied statistical thinking for some time. The *ad hoc* rule of thumb of a ratio of 10 subjects for each variable to estimate parameters confidently with adequate statistical power (Tanaka, 1987) is inappropriate for SEM with latent variables. There are at least two reasons for this (Holmes-Smith, 2010). First, "in structural equation models with latent variables, it is more appropriate to consider the ratio of the number of subjects to the number of parameters being estimated" (p.5.9) and second, "… the statistical theory underlying parameter estimation models is asymptotic in nature … (and) … the asymptotic statistical theory gives no clue as to just how large a "large" sample needs to be" (p. 5.10).

Boomsma (1983) suggest that as a general rule, the sample size in SEM should be 200 or more. However, using maximum likelihood (ML) estimation (traditionally used in most SEM analyses) in a Monte Carlo study using sample sizes ranging from 50 to 300 cases, Gerbing and Anderson (1985) found that although in sample sizes of less than 100 there was a lack of stability in parameter estimates, they achieved reasonably robust estimates with fewer than Boomsma's (1983) recommended sample size of 200.

A further complicating factor occurs in estimating sample size for the estimation and testing of structural equation models "… when the observed indicator variables used in the measurement part of the model do not meet the distributional assumptions underlying the estimation procedures used to fit such models" (Holmes-Smith, 2010, p. 5.10). Thus, when non-normal data is used, Satorra and Bentler (1994) suggest using ML estimation which is efficient even with small samples. However, they suggest making a post hoc adjustment to the Chi square statistic and the standard error estimates to overcome the fact that the Chi square test of model fit will be overstated, and the standard errors associated with parameter estimates will be underestimated, if the data is not normally distributed. The Bollen-Stine p statistic was used in this research where the data was not normally distributed.

Thus, in terms of what is a suitable sample size for use in SEM, bigger is better. However, based on Gerbing and Anderson's (1985) results, the sample size should at least be 100 participants. In this research, at $T_3$, n = 287 for the nascent entrepreneur/entrepreneur group and n = 106 for the non-entrepreneur group. Because of the repeated measures longitudinal design to collect data, observations of parameter estimates were undertaken at three data points to assess consistency. There was stability of parameter estimates across the three points in time suggesting the sample sizes for the two groups were adequate.

*Parcelling*: An additional approach to dealing with a small sample size is to use "parcelling". Parcelling involves averaging the question item responses for a particular construct. Parcelled items are then employed as construct indicator variables in subsequent SEM analyses.

There are some who disagree with the use of parcelling (see Little, Cunningham, Shahar, and Widaman, 2002 for a discussion on this topic) because they consider that (1) data modeling should mirror as closely as possible the original responses and (2) parcelling can hide the nature of the data relationships and can potentially conceal any model misspecifications (see, Cunningham, 2010).

However, there is strong support for using parcelling under certain circumstances because (1) parcelling can reduce the level of data non-normality (allowing SEM data assumptions to be met) and (2) parameter estimates are more stable when parcelling is used; thus, results have greater generalizability (this is because parcelling enhances the proportion of parameters estimated to sample size and this is attractive when sample sizes are small (Bandalos, 2002; Little, Cunningham, Shahar, and Widaman, 2002; Cunningham, 2010). Parcelling should only be used where the items within each parcel are unidimensional and thus potential parcel items need to be checked for unidimensionality prior to their parcelling (Cunningham, 2010).

### 8.3.8 Invariance Testing

Invariance testing involves using multi-group confirmatory factor analysis to examine the measurement equivalence among the relations of latent variables with their respective observed variables to determine whether these are the same for different groups (e.g., nascent entrepreneurs and non-entrepreneurs) or whether the groups vary in explicit ways across the groups on the constructs of interest (Byrne, Shavelson, and Muthen, 1989). It is important to establish measurement invariance between groups in case different groups interpret the meanings of the same constructs differently. If this occurs, then any construct comparisons between the two groups would be invalid (Cunningham, 2010): "As a minimum, the relations of latent variables with their indicators should be identical across groups if any meaningful group comparisons are to be made (Widaman and Reise, 1997)" (in Cunningham, 2010, p. 6-15).

For this reason, in this research, because there were two groups, invariance testing was undertaken between the two groups. In addition, to ensure that each of the groups interpreted the questions in a similar manner across time, invariance testing was undertaken between $T_1$ and $T_2$, $T_2$ and $T_3$, and $T_1$ and $T_3$ for each group.

Vandenberg and Lance (2000) provide guidance on the invariance testing process to be undertaken (their approach was adopted in this research). Their approach involves gradually testing progressively more constrained models that are nested in earlier estimated less constrained models using a chi-square difference test in each case (Cunningham, 2010).

Measurement invariance testing usually occurs before conducting any structural invariance tests. In AMOS, invariance testing occurs through using the Manage-Group Analysis function.

> "When the means and intercepts are checked (in AMOS), the default options in Multiple-Group Analysis will test in a hierarchical manner for configural (i.e., unconstrained model), metric (measurement weights model) and scalar (measurement intercepts model) invariance as well as invariant factor variances and covariances (structural co-variances model) and invariant uniqueness (measurement residuals). It is the tests of configural, metric and scalar invariance that must be satisfied prior to conducting any analyses involving comparisons of means across groups." (Cunningham, 2008, pp.7-8)

The progression of invariance tests usually progresses as follows. For measurement invariance testing, test of invariant covariance, test of configural invariance, test of metric invariance, test of scalar invariance, test of invariant uniqueness. For scalar invariance testing, test of invariant factor invariances and test of equal factor means. These tests are hierarchical and so if, for example, the chi-square of the test of invariant covariance is *not* significant, this supports the notion that the variance-covariance matrices are equivalent across groups. If this is the case, then this is an indication that the model has both measurement and structural invariance for all parameter estimates and, thus, no further invariance testing is required. If the chi-square difference test *is significant*, then testing moves to the next type of test (test of configural invariance) and so on.

In this research, the chi-square difference test of invariant covariance was not significant and thus no further invariance testing was necessary beyond this as this indicated that the variance-covariance matrices were equivalent across both groups.

### 8.3.9 Testing Moderating Hypotheses

A moderating or interaction hypothesis implies that the strength of the association between an exogenous and an endogenous variable varies for different groups or across different levels of another continuous variable (Cunningham, 2010). When the two variables that are the focus of a moderating hypothesis are continuous, various approaches have been recommended for examining the interaction (see, for example, Cortina, Chen, and Dunlap, 2001 for a discussion of the various approaches). Although the different methods result in comparable parameter estimates, their usability varies (Cunningham, 2010). In structural equation modeling, testing for possible moderating hypotheses is comparable to invariance testing (Cunningham, 2010). The steps to be followed (and that were adopted in this research are as follows:

(1) Tests of metric measurement invariance (that is, equivalent factor loadings across groups) for the model variables of interest must first be established. Once this is

determined, testing of the moderating variable hypothesis can proceed. Tests of metric equivalence of the variables of interest in this research were undertaken and were established thus allowing testing of the moderating hypothesis (that there will be differences between nascent and non-entrepreneur groups) to proceed.

(2) The model is first tested separately for each group to ensure that there is appropriate model fit. In this research, model fit was established at the measurement and structural levels.

(3) Using the Manage Models command (in AMOS), unconstrained and constrained models are developed.

a. *Unconstrained model* - the measurement factor loadings are set to equality and the structural parameters are allowed to vary freely.

b. *Constrained model* - the measurement factor loadings are set to equality and the hypothesised moderating variable paths are set to equality.

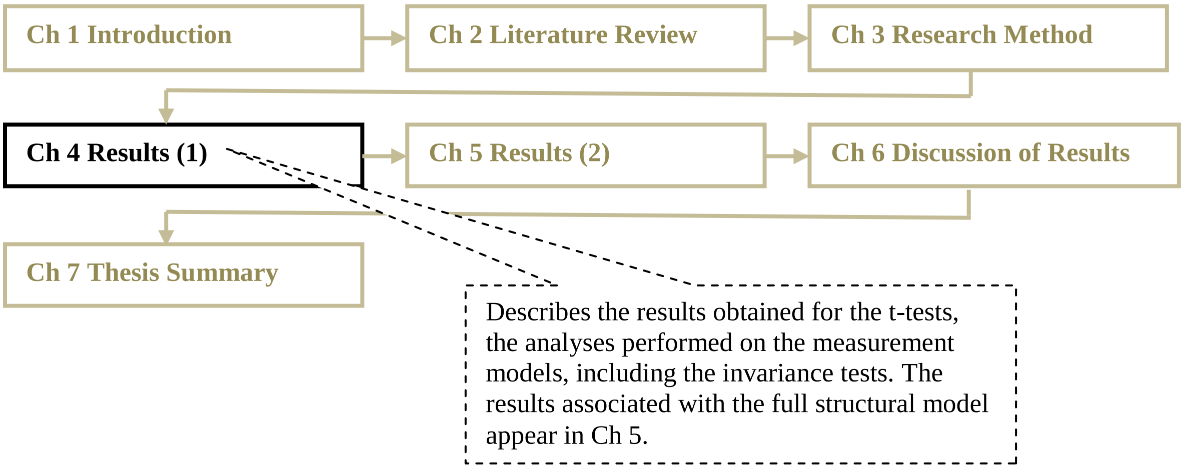
(4) The model is then run and a chi-square difference test is undertaken to determine if a significant difference exists between the unconstrained and constrained models. If so, this provides support for a moderating group hypothesis.

This approach to testing for a moderating effect of nascent entrepreneur versus non-entrepreneur groups on the variable relationships of interest over time was adopted in this research.

## 9.0 Chapter Summary

Chapter 3 provides details about the research method used in this study. It provides insights into the research design which is longitudinal with repeated measures taken at three points in time – $T_1$, $T_2$, and $T_3$ - over a 4.5 year period. A one-year entrepreneurship training, mentoring, and business incubation intervention program occurred between $T_1$ and $T_2$. There were two groups of participants – nascent entrepreneurs (who intended starting businesses) and non-entrepreneurs (who had no intention of starting businesses). Validated scales were used to measure the constructs of interest (values and entrepreneurial attitude) over the duration of the project. A structural model was developed that incorporated the constructs based upon existing theory. Structural equation modeling was the primary statistical technique used in the analysis with PASW used in various supporting analytical activities.

# Chapter 4
# Results (1)[8]
# Preliminary Analyses, Measurement Models, and Invariance Tests




## 1.0 Introduction

Chapter 4 presents the results of the data analyses undertaken in this research. The results are presented in two sections based upon the following analyses...

- Initial data analyses using SPSS (PASW) were undertake so as to better appreciate the nature of the variables of interest (Section 2), and
- Advanced data analyses (that primarily relied on using the Structural Equation Modeling package, AMOS) were undertaken which involved examining individual and full measurement models. This involved undertaking confirmatory factor analyses of the individual measurement models and the combined measurement models. In addition, invariance testing was undertaken to determine whether each group interpreted the survey questions in a similar manner (Section 3). The full structural model analysis results appear in Chapter 5.

## 2.0 Initial Data Analyses

This section presents the means, standard deviations, reliabilities, and paired and independent t-tests for the following constructs/variables ...

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8 This is a long Chapter due to the nature of the analyses required. Because the research design involves repeated measures over time with three data sets collected at $T_1$, $T_2$, and $T_3$ (multiply this by two since there is one set of data requiring analysis for each of the nascent and non-entrepreneur groups), there are therefore 3 x 2 sets of analyses. This requires considerably more space for describing the results compared to, say, a cross-sectional study at one point in time with only one group of participants to analyse. This is also why the results of further analyses appear in Chapter 5 and in Appendix 4.

- Values
- Entrepreneurial Attitude
- Entrepreneurial Start-Up Intention, and
- Business Start-Up Behaviour.

These analyses were undertaken to gain an understanding of the nature of the constructs/variables over time and as to how they differed (if at all) between the Nascent Entrepreneur and Non-Entrepreneur Groups. .

## 2.1 Values

Prior research has identified values as being relatively stable over time (Rockeach, 1973). Using a validated Values scale, referred to as the List of Values or "LOV", (Kahle, 1983; Kahle, Beatty, and Homer, 1986 ), this section presents the results of preliminary analyses of the Values construct dimensions (Internal, External, and Interpersonal Values) to determine their stability over the life of this research. Values measurements were taken at $T_1$, $T_2$, and $T_3$ for each of the three dimensions. Exhibits 4.1 and 4.2 present a summary of the Values dimensions means, standard deviations, and associated reliabilities at $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur Group (n = 287) and Non-Entrepreneur Group (n = 106) respectively. In all cases, scale reliabilities were above 0.70 meeting Nunnally's (1978) reliability standards.

| Values Dimension | $T_1$ Means (SDs) (Reliabilities) | $T_2$ Means (SDs) (Reliabilities) | $T_3$ Means (SDs) (Reliabilities) |
|---|---|---|---|
| **Internal Values** | 6.024 (1.466) (0.775) | 6.034 (1.427) (0.786) | 6.026 (1.432) (0.779) |
| **External Values** | 5.589 (1.398) (0.845) | 5.616 (1.257) (0.840) | 5.628 (1.194) (0.858) |
| **Interpersonal Values** | 5.526 (1.498) (0.777) | 5.519 (1.398) (0.777) | 5.521 (1.428) (0.763) |

**Exhibit 4.1: Values Means, SDs, & Reliabilities at $T_1$, $T_2$, and $T_3$**
**(*Nascent Entrepreneurs*)**

| Values Dimension | $T_1$ Means (SDs) (Reliabilities) | $T_2$ Means (SDs) (Reliabilities) | $T_3$ Means (SDs) (Reliabilities) |
|---|---|---|---|
| **Internal Values** | 4.528 (1.721) (0.876) | 4.575 (1.499) (0.818) | 4.579 (1.531) (0.804) |
| **External Values** | 5.255 (1.565) (0.876) | 5.219 (1.429) (0.830) | 5.311 (1.488) (0.831) |
| **Interpersonal Values** | 5.434 (1.643) (0.763) | 5.476 (1.456) (0.775) | 5.575 (1.447) (0.769) |

**Exhibit 4.2: Values, Standard Deviations, Means and Reliabilities at $T_1$, $T_2$, and $T_3$ (*Non-Entrepreneurs*)**

Exhibits 4.3 and 4.4 graph the means of the internal, external, and interpersonal values for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

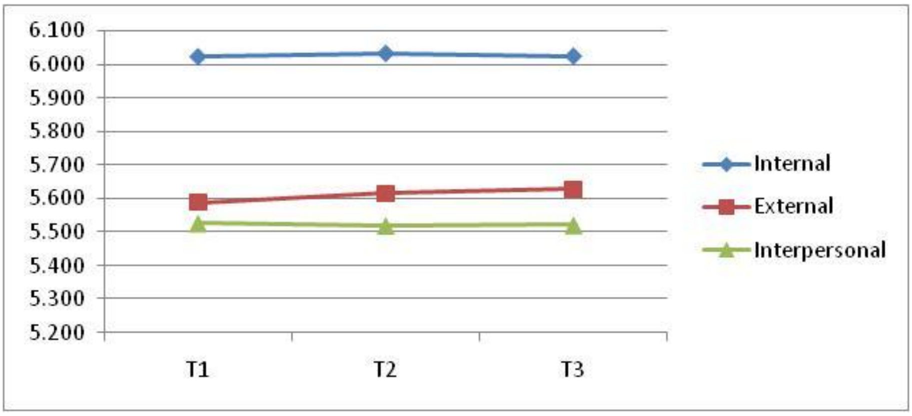



**Exhibit 4.3: Values Means Graphed at $T_1$, $T_2$, and $T_3$ (*Nascent Entrepreneurs*)**

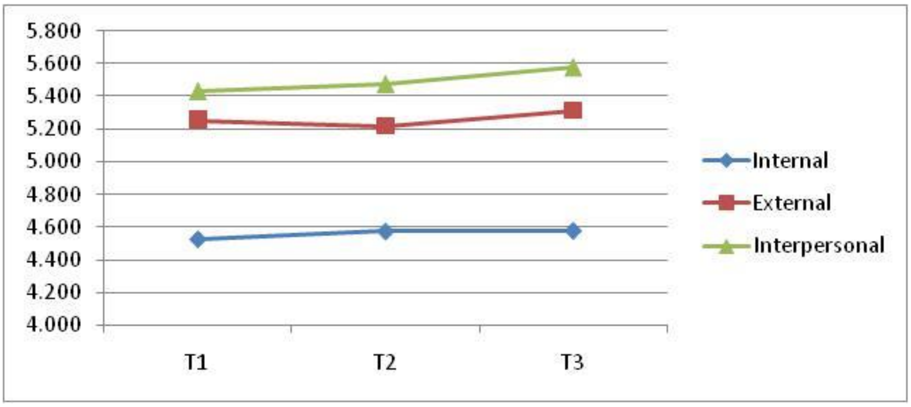



**Exhibit 4.4: Values Means Graphed at $T_1$, $T_2$, and $T_3$ (*Non-Entrepreneurs*)**

Using SPSS, Paired Samples Tests were undertaken on the Internal, External, and Interpersonal Values means at $T_1$, $T_2$, and $T_3$ to determine if there were any significant differences among means at the three points of time for each group. These test results are presented for the Nascent Entrepreneur Group in Exhibits 4.5 (Internal Values dimension), 4.6

(External Values dimension), and 4.7 (Interpersonal Values dimension) and for the Non-Entrepreneur Group in Exhibits 4.8 (Internal Values dimension), 4.9 (External Values dimension), and 4.10 (Interpersonal Values dimension). As can be seen from the relevant Exhibits, there were no significant Values means changes over $T_1$, $T_2$, and $T_3$ for either of the groups as indicated by the lack of significance results in the "Sig. (2-tailed)" column for each of the three dimensions in each group.

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tvalint1 | 6.02 | 287 | 1.466 | .087 |
| | tvalint2 | 6.03 | 287 | 1.427 | .084 |
| Pair 2 | tvalint2 | 6.03 | 287 | 1.427 | .084 |
| | tvalint3 | 6.03 | 287 | 1.432 | .085 |
| Pair 3 | tvalint1 | 6.02 | 287 | 1.466 | .087 |
| | tvalint3 | 6.03 | 287 | 1.432 | .085 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tvalint1 & tvalint2 | 287 | .985 | .000 |
| Pair 2 | tvalint2 & tvalint3 | 287 | .975 | .000 |
| Pair 3 | tvalint1 & tvalint3 | 287 | .970 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tvalint1 - tvalint2 | -.009 | .257 | .015 | -.039 | .021 | -.613 | 286 | .540 |
| Pair 2 | tvalint2 - tvalint3 | .008 | .320 | .019 | -.029 | .045 | .431 | 286 | .667 |
| Pair 3 | tvalint1 - tvalint3 | -.001 | .359 | .021 | -.043 | .041 | -.055 | 286 | .956 |

**Exhibit 4.5: Paired Internal Values Samples Results for $T_1$, $T_2$, and $T_3$ (*Nascent Entrepreneurs*)**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tvalext1 | 5.59 | 287 | 1.398 | .083 |
| | tvalext2 | 5.62 | 287 | 1.257 | .074 |
| Pair 2 | tvalext2 | 5.62 | 287 | 1.257 | .074 |
| | tvalext3 | 5.63 | 287 | 1.194 | .071 |
| Pair 3 | tvalext1 | 5.59 | 287 | 1.398 | .083 |
| | tvalext3 | 5.63 | 287 | 1.194 | .071 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tvalext1 & tvalext2 | 287 | .933 | .000 |
| Pair 2 | tvalext2 & tvalext3 | 287 | .914 | .000 |
| Pair 3 | tvalext1 & tvalext3 | 287 | .936 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tvalext1 - tvalext2 | -.027 | .505 | .030 | -.086 | .032 | -.906 | 286 | .366 |
| Pair 2 | tvalext2 - tvalext3 | -.012 | .512 | .030 | -.072 | .047 | -.403 | 286 | .687 |
| Pair 3 | tvalext1 - tvalext3 | -.039 | .505 | .030 | -.098 | .019 | -1.314 | 286 | .190 |

## Exhibit 4.6: Paired *External* Values Samples Results for $T_1$, $T_2$, and $T_3$ (*Nascent Entrepreneurs*)

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tvalfun1 | 5.53 | 287 | 1.498 | .088 |
| | tvalfun2 | 5.5192 | 287 | 1.39823 | .08253 |
| Pair 2 | tvalfun2 | 5.5192 | 287 | 1.39823 | .08253 |
| | tvalfun3 | 5.5209 | 287 | 1.42821 | .08430 |
| Pair 3 | tvalfun1 | 5.53 | 287 | 1.498 | .088 |
| | tvalfun3 | 5.5209 | 287 | 1.42821 | .08430 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tvalfun1 & tvalfun2 | 287 | .960 | .000 |
| Pair 2 | tvalfun2 & tvalfun3 | 287 | .943 | .000 |
| Pair 3 | tvalfun1 & tvalfun3 | 287 | .975 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tvalfun1 - tvalfun2 | .00697 | .42015 | .02480 | -.04185 | .05578 | .281 | 286 | .779 |
| Pair 2 | tvalfun2 - tvalfun3 | -.00174 | .47947 | .02830 | -.05745 | .05396 | -.062 | 286 | .951 |
| Pair 3 | tvalfun1 - tvalfun3 | .00523 | .33315 | .01967 | -.03348 | .04393 | .266 | 286 | .791 |

## Exhibit 4.7: Paired *Interpersonal* Values Samples Results for $T_1$, $T_2$, and $T_3$ (*Nascent Entrepreneurs*)

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tvalint1 | 4.53 | 106 | 1.721 | .167 |
| | tvalint2 | 4.58 | 106 | 1.499 | .146 |
| Pair 2 | tvalint2 | 4.58 | 106 | 1.499 | .146 |
| | tvalint3 | 4.58 | 106 | 1.531 | .149 |
| Pair 3 | tvalint1 | 4.53 | 106 | 1.721 | .167 |
| | tvalint3 | 4.58 | 106 | 1.531 | .149 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tvalint1 & tvalint2 | 106 | .939 | .000 |
| Pair 2 | tvalint2 & tvalint3 | 106 | .923 | .000 |
| Pair 3 | tvalint1 & tvalint3 | 106 | .941 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tvalint1 - tvalint2 | -.047 | .602 | .059 | -.163 | .069 | -.806 | 105 | .422 |
| Pair 2 | tvalint2 - tvalint3 | -.003 | .597 | .058 | -.118 | .112 | -.054 | 105 | .957 |
| Pair 3 | tvalint1 - tvalint3 | -.050 | .591 | .057 | -.164 | .063 | -.877 | 105 | .382 |

**Exhibit 4.8: Paired *Internal* Values Samples Results for $T_1$, $T_2$, and $T_3$ (*Non-Entrepreneurs*)**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tvalext1 | 5.25 | 106 | 1.565 | .152 |
| | tvalext2 | 5.22 | 106 | 1.429 | .139 |
| Pair 2 | tvalext2 | 5.22 | 106 | 1.429 | .139 |
| | tvalext3 | 5.31 | 106 | 1.489 | .145 |
| Pair 3 | tvalext1 | 5.25 | 106 | 1.565 | .152 |
| | tvalext3 | 5.31 | 106 | 1.489 | .145 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tvalext1 & tvalext2 | 106 | .955 | .000 |
| Pair 2 | tvalext2 & tvalext3 | 106 | .943 | .000 |
| Pair 3 | tvalext1 & tvalext3 | 106 | .964 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tvalext1 - tvalext2 | .035 | .470 | .046 | -.055 | .126 | .775 | 105 | .440 |
| Pair 2 | tvalext2 - tvalext3 | -.092 | .496 | .048 | -.187 | .003 | -1.911 | 105 | .059 |
| Pair 3 | tvalext1 - tvalext3 | -.057 | .417 | .041 | -.137 | .024 | -1.397 | 105 | .166 |

**Exhibit 4.9: Paired *External* Values Samples Results for $T_1$, $T_2$, and $T_3$ (*Non-Entrepreneurs*)**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tvalfun1 | 5.43 | 106 | 1.643 | .160 |
| | tvalfun2 | 5.48 | 106 | 1.456 | .141 |
| Pair 2 | tvalfun2 | 5.48 | 106 | 1.456 | .141 |
| | tvalfun3 | 5.58 | 106 | 1.447 | .141 |
| Pair 3 | tvalfun1 | 5.43 | 106 | 1.643 | .160 |
| | tvalfun3 | 5.58 | 106 | 1.447 | .141 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tvalfun1 & tvalfun2 | 106 | .892 | .000 |
| Pair 2 | tvalfun2 & tvalfun3 | 106 | .882 | .000 |
| Pair 3 | tvalfun1 & tvalfun3 | 106 | .886 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tvalfun1 - tvalfun2 | -.042 | .744 | .072 | -.186 | .101 | -.588 | 105 | .558 |
| Pair 2 | tvalfun2 - tvalfun3 | -.099 | .705 | .068 | -.235 | .037 | -1.446 | 105 | .151 |
| Pair 3 | tvalfun1 - tvalfun3 | -.142 | .761 | .074 | -.288 | .005 | -1.913 | 105 | .058 |

**Exhibit 4.10: Paired *Interpersonal* Values Samples Results for $T_1$, $T_2$, and $T_3$ (*Non-Entrepreneurs*)**

The fact that there was no significant change in Values over time for either group is in line with existing theory (Rokeach, 1973). Thus, for simplicity and for model parsimony purposes, only the Values measurements taken at $T_1$ were used in developing the full structural model (the Values measurements taken at $T_2$ and $T_3$ were ignored because of their quantum similarity to those at $T_1$). The results of the analysis of the full structural model appear at the end of this Chapter.

Exhibits 4.11 to 4.13 provide comparative graphs of the means of the Internal, External, and Interpersonal Values for the Nascent Entrepreneur versus Non-Entrepreneur Groups respectively.

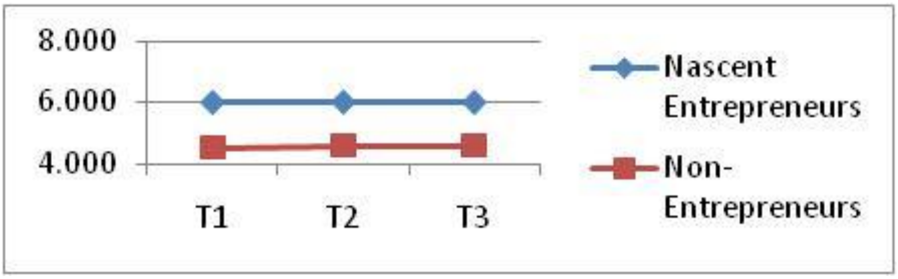



**Exhibit 4.11: Internal Values Means Graphed at $T_1$, $T_2$, and $T_3$ (*Nascent* versus *Non-Entrepreneurs*)**

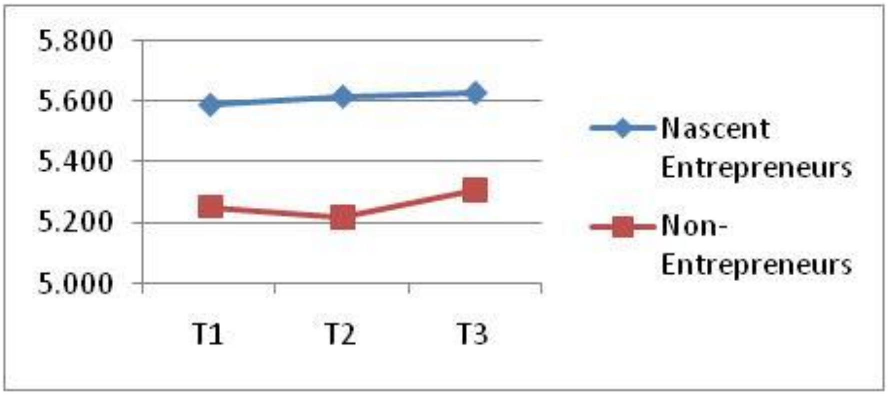



**Exhibit 4.12: External Values Means Graphed at $T_1$, $T_2$, and $T_3$ (*Nascent* versus *Non-Entrepreneurs*)**

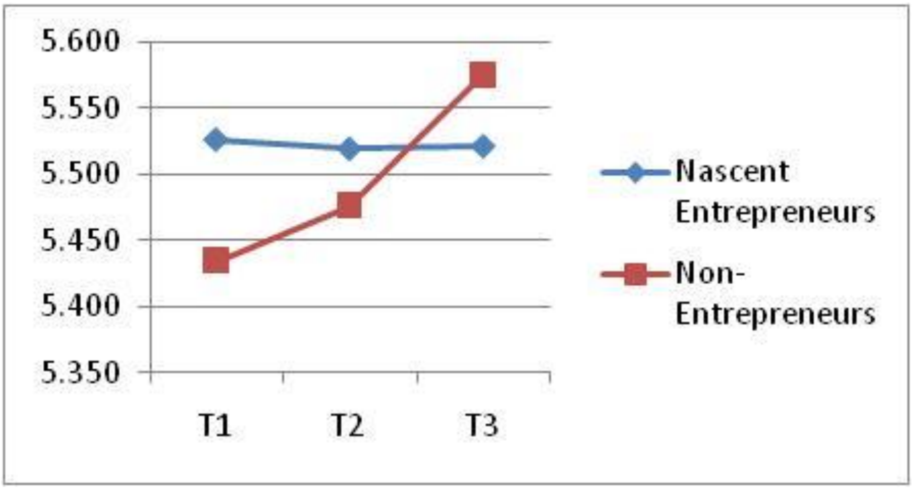



**Exhibit 4.13: Interpersonal Values Means Graphed at $T_1$, $T_2$, and $T_3$ (*Nascent* versus *Non-Entrepreneurs*)**

Exhibit 4.14 provides the results of a series of t-tests that compare the means of the Internal, External, and Interpersonal Values at $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

**Group Statistics**

| | entornot | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| tvalint1 | 1 | 287 | 6.02 | 1.466 | .087 |
| | 2 | 106 | 4.53 | 1.721 | .167 |
| tvalint2 | 1 | 287 | 6.03 | 1.427 | .084 |
| | 2 | 106 | 4.58 | 1.499 | .146 |
| tvalint3 | 1 | 287 | 6.03 | 1.432 | .085 |
| | 2 | 106 | 4.58 | 1.531 | .149 |
| tvalext1 | 1 | 287 | 5.59 | 1.398 | .083 |
| | 2 | 106 | 5.25 | 1.565 | .152 |
| tvalext2 | 1 | 287 | 5.62 | 1.257 | .074 |
| | 2 | 106 | 5.22 | 1.429 | .139 |
| tvalext3 | 1 | 287 | 5.63 | 1.194 | .071 |
| | 2 | 106 | 5.31 | 1.488 | .145 |
| tvalfun1 | 1 | 287 | 5.53 | 1.498 | .088 |
| | 2 | 106 | 5.43 | 1.643 | .160 |
| tvalfun2 | 1 | 287 | 5.52 | 1.398 | .083 |
| | 2 | 106 | 5.48 | 1.456 | .141 |
| tvalfun3 | 1 | 287 | 5.52 | 1.428 | .084 |
| | 2 | 106 | 5.58 | 1.447 | .141 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| tvalint1 | Equal variances assumed | 4.964 | .026 | 8.556 | 391 | .000 | 1.496 | .175 | 1.152 | 1.840 |
| | Equal variances not assumed | | | 7.950 | 164.505 | .000 | 1.496 | .188 | 1.124 | 1.868 |
| tvalint2 | Equal variances assumed | .771 | .381 | 8.867 | 391 | .000 | 1.458 | .164 | 1.135 | 1.782 |
| | Equal variances not assumed | | | 8.669 | 179.712 | .000 | 1.458 | .168 | 1.126 | 1.790 |
| tvalint3 | Equal variances assumed | 1.352 | .246 | 8.724 | 391 | .000 | 1.447 | .166 | 1.121 | 1.773 |
| | Equal variances not assumed | | | 8.460 | 177.046 | .000 | 1.447 | .171 | 1.109 | 1.784 |
| tvalext1 | Equal variances assumed | 1.949 | .164 | 2.035 | 391 | .043 | .334 | .164 | .011 | .657 |
| | Equal variances not assumed | | | 1.932 | 170.572 | .055 | .334 | .173 | -.007 | .676 |
| tvalext2 | Equal variances assumed | 2.548 | .111 | 2.672 | 391 | .008 | .397 | .148 | .105 | .688 |
| | Equal variances not assumed | | | 2.519 | 168.530 | .013 | .397 | .157 | .086 | .707 |
| tvalext3 | Equal variances assumed | 7.284 | .007 | 2.193 | 391 | .029 | .319 | .145 | .033 | .605 |
| | Equal variances not assumed | | | 1.984 | 157.619 | .049 | .319 | .161 | .001 | .637 |
| tvalfun1 | Equal variances assumed | .774 | .380 | .527 | 391 | .598 | .092 | .175 | -.252 | .436 |
| | Equal variances not assumed | | | .505 | 173.324 | .614 | .092 | .182 | -.268 | .452 |
| tvalfun2 | Equal variances assumed | .004 | .947 | .266 | 391 | .790 | .043 | .161 | -.273 | .359 |
| | Equal variances not assumed | | | .261 | 180.967 | .794 | .043 | .164 | -.280 | .366 |
| tvalfun3 | Equal variances assumed | .013 | .910 | -.335 | 391 | .738 | -.055 | .163 | -.375 | .266 |
| | Equal variances not assumed | | | -.333 | 185.326 | .740 | -.055 | .164 | -.378 | .269 |

**Exhibit 4.14: T-Test Results for Internal, External, & Interpersonal Values at $T_1$, $T_2$, & $T_3$ (*Nascent* vs *Non-Entrepreneurs*)**

The appropriate line to use in examining the "Sig (2-tailed)" column in the Independent Samples Test "t-test for Equality of Means" section is determined by Levene's test for equality of variances. The appropriate decision rule is, if the "Sig" value in the "Levene's test for equality of variances" section is greater than 0.05, then "Equal variances are assumed"; however, if the "Sig" value in the "Levene's test for equality of variances" section is less than or equal to 0.05, then "Equal variances are *not* assumed".

In applying these decision rules, all relevant Sig (2-Tailed) values are significant for Internal and External Values at $T_1$, $T_2$, and $T_3$; however, the appropriate Sig (2-Tailed) values for Interpersonal Values are *not* significant at $T_1$, $T_2$, or $T_3$. Thus, we can conclude that there are significant Internal and External Values mean differences between the Nascent and Non-Entrepreneur Groups at $T_1$, $T_2$, and $T_3$ but there are no significant Interpersonal Values mean differences between the Nascent and Non-Entrepreneur Groups at $T_1$, $T_2$, and $T_3$.

## 2.2 Entrepreneurial Attitude

Unlike values, attitudes are susceptible to change (Rokeach, 1973; Schwartz, 1992). Thus, Entrepreneurial Attitude may not necessarily be a reliable indicator of an individual's entrepreneurial tendencies (Lindsay, Lindsay, and Kropp, 2009). This section presents the results of a preliminary analysis of the Entrepreneurial Attitude construct dimensions to determine its stability over the life of this research. Entrepreneurial Attitude measurements were taken at $T_1$, $T_2$, and $T_3$. Exhibits 4.15 and 4.16 present a summary of the Entrepreneurial Attitude dimensions means, standard deviations, and associated reliabilities at $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur Group (n = 287) and Non-Entrepreneur Group (n = 106) respectively. In all cases, scale reliabilities were above 0.70 meeting Nunnally's (1978) reliability standards.

| **Entrepreneurial Attitude Dimension** | **$T_1$ Means (SDs) (Reliabilities)** | **$T_2$ Means (SDs) (Reliabilities)** | **$T_3$ Means (SDs) (Reliabilities)** |
|---|---|---|---|
| **Opportunity Recognition** | 5.743 (1.440) (0.891) | 6.587 (1.225) (0.870) | 5.843 (1.206) (0.861) |

**Exhibit 4.15: Entrepreneurial Attitude Means, SDs, & Reliabilities at $T_1$, $T_2$, & $T_3$ (*Nascent Entrepreneurs*)**

| **Entrepreneurial Attitude Dimension** | **$T_1$ Means (SDs) (Reliabilities)** | **$T_2$ Means (SDs) (Reliabilities)** | **$T_3$ Means (SDs) (Reliabilities)** |
|---|---|---|---|
| **Opportunity Recognition** | 4.590 (1.672) (0.957) | 6.712 (1.367) (0.858) | 4.718 (1.473) (0.881) |

**Exhibit 4.16: Entrepreneurial Attitude Means, SDs, & Reliabilities at $T_1$, $T_2$, & $T_3$ (*Non-Entrepreneurs*)**

Exhibits 4.17 and 4.18 graph the Entrepreneurial Attitude means for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

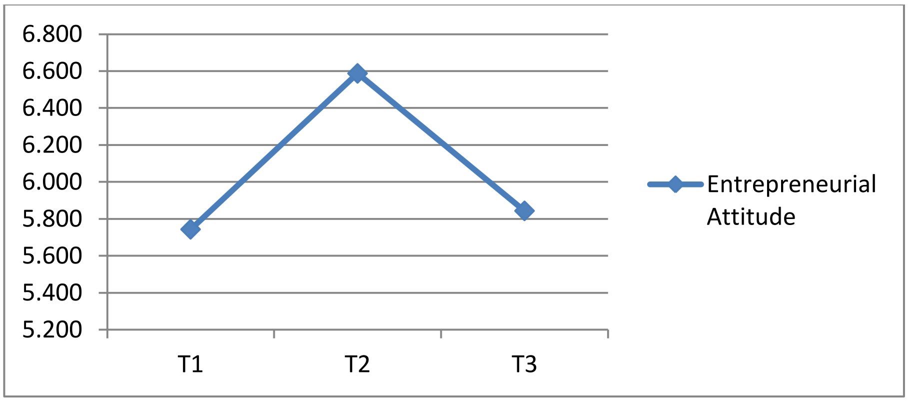



**Exhibit 4.17: Entrepreneurial Attitude Means Graphed at $T_1$, $T_2$, and $T_3$ (*Nascent Entrepreneurs*)**

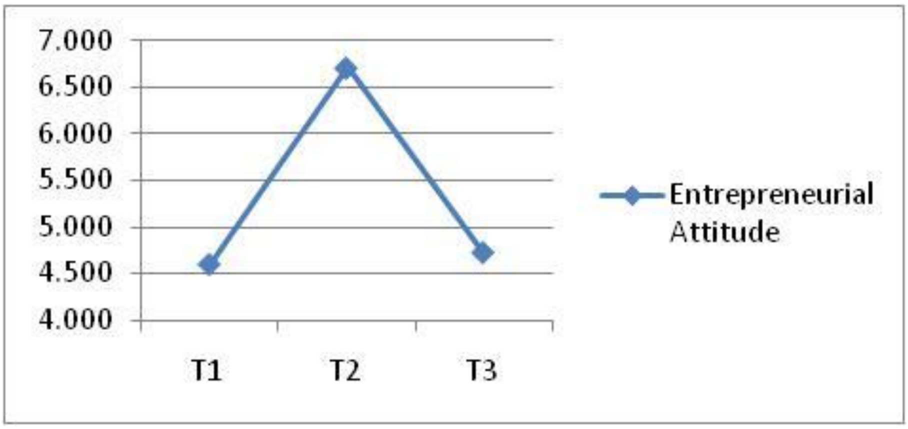



**Exhibit 4.18: Entrepreneurial Attitude Means Graphed at $T_1$, $T_2$, and $T_3$ (*Non-Entrepreneurs*)**

Using SPSS, Paired Samples Tests were undertaken on the Entrepreneurial Attitude means at $T_1$, $T_2$, and $T_3$ to determine if there were any significant differences among the means at the three points of time for each group. These test results are presented for the Nascent Entrepreneur Group in Exhibit 4.19 and for the Non-Entrepreneur Group in Exhibit 4.20.

As can be seen from the relevant Exhibits, as indicated by the significance results in the "Sig. (2-tailed)" column in each group, there were significant Entrepreneurial Attitude means changes over $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur Group (Exhibit 4.19). The $T_3$ Entrepreneurial Attitude mean (5.8432) was significantly higher ($p < 0.01$) than at $T_1$ (5.7432) (4.5 years after the commencement of the program). There also was a significant difference between the $T_1$ and $T_2$ means ($p < 0.001$) and the $T_2$ and $T_3$ means ($p < 0.001$) with Entrepreneurial Attitude peaking at $T_2$.

For the Non-Entrepreneur Group (Exhibit 4.20), there were significant Entrepreneurial Attitude mean changes at $T_1$ and $T_2$ and $T_2$ and $T_3$ but not between $T_1$ and $T_3$. In other words, for the Non-Entrepreneurs, their Entrepreneurial Attitude mean levels at $T_3$ (4.5 years after $T_1$) remained around the same as they were at $T_1$ (they actually increased from 4.5903 at $T_1$ to 4.7183 at $T_3$ – but the increase was non-significant) after peaking at $T_2$ (6.7116) (resulting in significant differences between $T_1$ and $T_2$ ($p < 0.001$) and $T_2$ and $T_3$ ($p < 0.001$)).

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tattop1 | 5.7432 | 287 | 1.44032 | .08502 |
| | tattop2 | 6.5874 | 287 | 1.22502 | .07231 |
| Pair 2 | tattop2 | 6.5874 | 287 | 1.22502 | .07231 |
| | tattop3 | 5.8432 | 287 | 1.20555 | .07116 |
| Pair 3 | tattop1 | 5.7432 | 287 | 1.44032 | .08502 |
| | tattop3 | 5.8432 | 287 | 1.20555 | .07116 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tattop1 & tattop2 | 287 | .896 | .000 |
| Pair 2 | tattop2 & tattop3 | 287 | .942 | .000 |
| Pair 3 | tattop1 & tattop3 | 287 | .902 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tattop1 - tattop2 | -.84420 | .64397 | .03801 | -.91902 | -.76938 | -22.208 | 286 | .000 |
| Pair 2 | tattop2 - tattop3 | .74415 | .41516 | .02451 | .69592 | .79239 | 30.366 | 286 | .000 |
| Pair 3 | tattop1 - tattop3 | -.10005 | .62921 | .03714 | -.17315 | -.02695 | -2.694 | 286 | .007 |

**Exhibit 4.19: Paired Entrepreneurial Attitude Samples Results for $T_1$, $T_2$, & $T_3$ (*Nascent Entrepreneurs*)**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | tattop1 | 4.5903 | 106 | 1.67159 | .16236 |
| | tattop2 | 6.7116 | 106 | 1.36683 | .13276 |
| Pair 2 | tattop2 | 6.7116 | 106 | 1.36683 | .13276 |
| | tattop3 | 4.7183 | 106 | 1.47337 | .14311 |
| Pair 3 | tattop1 | 4.5903 | 106 | 1.67159 | .16236 |
| | tattop3 | 4.7183 | 106 | 1.47337 | .14311 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | tattop1 & tattop2 | 106 | .878 | .000 |
| Pair 2 | tattop2 & tattop3 | 106 | .850 | .000 |
| Pair 3 | tattop1 & tattop3 | 106 | .859 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | tattop1 - tattop2 | -2.12129 | .80783 | .07846 | -2.27687 | -1.96572 | -27.035 | 105 | .000 |
| Pair 2 | tattop2 - tattop3 | 1.99326 | .78528 | .07627 | 1.84203 | 2.14450 | 26.133 | 105 | .000 |
| Pair 3 | tattop1 - tattop3 | -.12803 | .85645 | .08319 | -.29297 | .03691 | -1.539 | 105 | .127 |

**Exhibit 4.20: Paired Entrepreneurial Attitude Samples Results for $T_1$, $T_2$, & $T_3$**
**(*Non-Entrepreneurs*)**

Exhibit 4.21 provides a comparative graph of the entrepreneurial attitude means for the Nascent Entrepreneur versus Non-Entrepreneur Groups respectively.

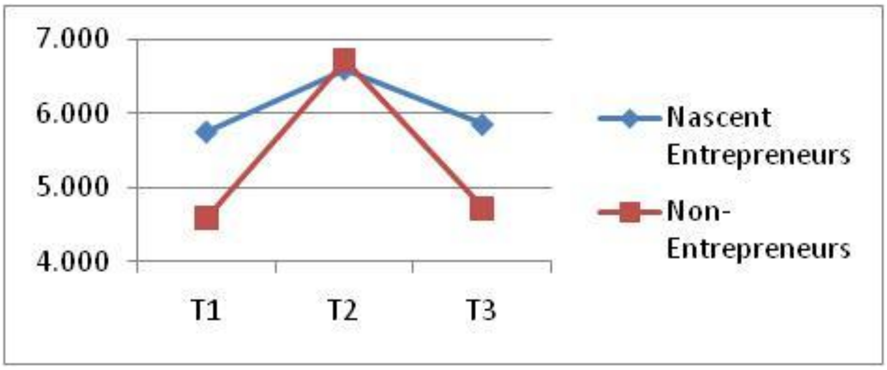



**Exhibit 4.21: Entrepreneurial Attitude Means Graphed at $T_1$, $T_2$, & $T_3$**
**(*Nascent* versus *Non-Entrepreneurs*)**

Exhibit 4.22 provides the results of a series of t-tests that compare the means of Entrepreneurial Attitude at $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

**Group Statistics**

| | entornot | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| tattop1 | 1 | 287 | 5.7432 | 1.44032 | .08502 |
| | 2 | 106 | 4.5903 | 1.67159 | .16236 |
| tattop2 | 1 | 287 | 6.5874 | 1.22502 | .07231 |
| | 2 | 106 | 6.7116 | 1.36683 | .13276 |
| tattop3 | 1 | 287 | 5.8432 | 1.20555 | .07116 |
| | 2 | 106 | 4.7183 | 1.47337 | .14311 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| tattop1 | Equal variances assumed | 5.209 | .023 | 6.736 | 391 | .000 | 1.15286 | .17116 | .81635 | 1.48937 |
| | Equal variances not assumed | | | 6.290 | 165.900 | .000 | 1.15286 | .18327 | .79101 | 1.51471 |
| tattop2 | Equal variances assumed | 3.840 | .051 | -.864 | 391 | .388 | -.12423 | .14374 | -.40683 | .15837 |
| | Equal variances not assumed | | | -.822 | 171.018 | .412 | -.12423 | .15117 | -.42264 | .17417 |
| tattop3 | Equal variances assumed | 8.239 | .004 | 7.714 | 391 | .000 | 1.12488 | .14582 | .83819 | 1.41157 |
| | Equal variances not assumed | | | 7.038 | 159.760 | .000 | 1.12488 | .15982 | .80924 | 1.44052 |

**Exhibit 4.22: T-Test Results for Entrepreneurial Attitude at $T_1$, $T_2$, & $T_3$**
**(*Nascent* versus *Non-Entrepreneurs*)**

In examining the Sig (2-Tailed) values appearing in Exhibit 4.22, there are significant Entrepreneurial Attitude mean differences between the Nascent and Non-Entrepreneur Groups at $T_1$ and $T_3$ ($p<0.001$) but there is no significant difference between the Nascent and Non-Entrepreneur Groups for the Entrepreneurial Attitude means at $T_2$.

## 2.3 Entrepreneurial Intention

A “Yes/No” entrepreneurial intention question was used to divide the sample into the two groups: nascent entrepreneurs (n = 287) and non-entrepreneurs (n = 106). This was a categorizing question and was subsequently used in examining whether group membership had a moderating effect on model relationships (refer Chapter 5).

A second Entrepreneurial Intention question, utilising a 7-Point Likert Scale, was used in the Entrepreneurial Intention data analysis and the results appear in this section. In the analysis, Entrepreneurial Intention was measured in terms of how likely it would be that a participant would start a business within the foreseeable future. Entrepreneurial Intention measurements were taken at $T_1$, $T_2$, and $T_3$. Exhibits 4.23 and 4.24 present the Entrepreneurial Intention means and standard deviations at $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur Group (n = 287) and Non-Entrepreneur Group (n = 106) respectively.

| Entrepreneurial Intention Dimension | $T_1$ Mean (SD) | $T_2$ Mean (SD) | $T_3$ Mean (SD) |
|---|---|---|---|
| **Intention to start a business** | 5.51 (0.848) | 5.81 (0.852) | 5.69 (0.867) |

**Exhibit 4.23: Entrepreneurial Intention Means & Standard Deviations at $T_1$, $T_2$, & $T_3$**
**(*Nascent Entrepreneurs*)**

| Entrepreneurial Intention Dimension | $T_1$ Mean (SD) | $T_2$ Mean (SD) | $T_3$ Mean (SD) |
|---|---|---|---|
| **Intention to start a business** | 4.60 (1.721) | 4.89 (1.708) | 4.72 (1.814) |

**Exhibit 4.24: Entrepreneurial Intention Means & SDs at $T_1$, $T_2$, & $T_3$ (*Non-Entrepreneurs*)**

Exhibits 4.25 and 4.26 graph the Entrepreneurial Intention means for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

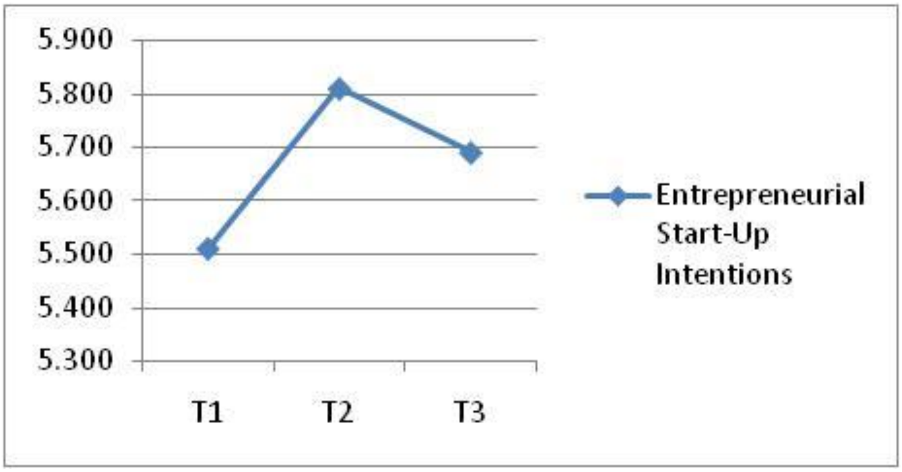



**Exhibit 4.25: Entrepreneurial Intention Means Graphed at $T_1$, $T_2$, & $T_3$ (*Nascent Entrepreneurs*)**

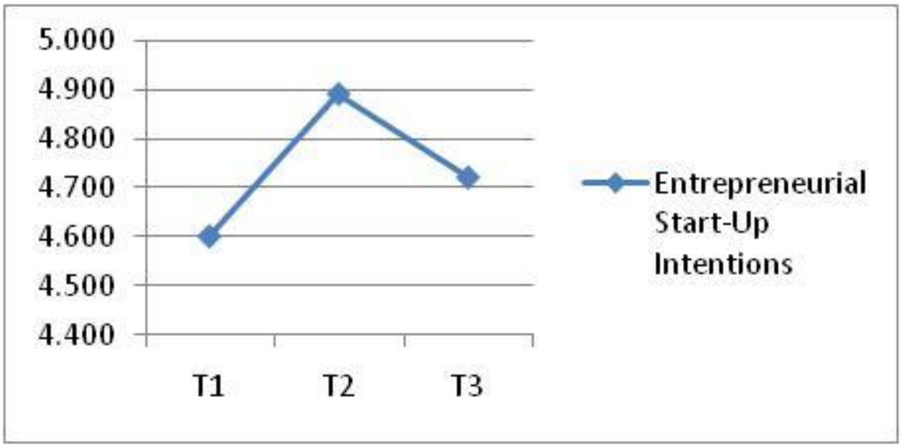



**Exhibit 4.26: Entrepreneurial Intention Means Graphed at $T_1$, $T_2$, & $T_3$ (*Non-Entrepreneurs*)**

Using SPSS, Paired Samples Tests were undertaken on the Entrepreneurial Intention means at $T_1$, $T_2$, and $T_3$ to determine if there were any significant differences among the means at the three points of time for each group. These test results are presented for the Nascent Entrepreneur Group in Exhibit 4.27 and for the Non-Entrepreneur Group in Exhibit 4.28.

As can be seen from the relevant Exhibits, the results in the "Sig. (2-tailed)" column for each group indicate there were significant Entrepreneurial Intentions mean changes over $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur Group (Exhibit 4.27) with the $T_3$ mean (5.69) being significantly higher ($p < 0.001$) than at $T_1$ (5.51) (representing a 3.3% increase 4.5 years after the commencement of the program). Intentions peaked at $T_2$ (mean = 5.81 immediately after the training intervention) and there was a significant difference between the $T_2$ mean and the T1 and $T_3$ means ($p<0.001$).

For the Non-Entrepreneur Group (Exhibit 4.28), there were significant Entrepreneurial Intentions means changes at $T_1$, $T_2$, and $T_3$. In other words, for the Non-Entrepreneurs, their Entrepreneurial Intentions mean levels at $T_3$ (4.72), which was 4.5 years after $T_1$, increased significantly by 0.12 (2.6%) over their $T_1$ levels (4.60).

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | intent1 | 5.51 | 287 | .848 | .050 |
| | intent2 | 5.81 | 287 | .852 | .050 |
| Pair 2 | intent2 | 5.81 | 287 | .852 | .050 |
| | intent3 | 5.69 | 287 | .867 | .051 |
| Pair 3 | intent1 | 5.51 | 287 | .848 | .050 |
| | intent3 | 5.69 | 287 | .867 | .051 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | intent1 & intent2 | 287 | .753 | .000 |
| Pair 2 | intent2 & intent3 | 287 | .754 | .000 |
| Pair 3 | intent1 & intent3 | 287 | .704 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | intent1 - intent2 | -.300 | .598 | .035 | -.369 | -.230 | -8.491 | 286 | .000 |
| Pair 2 | intent2 - intent3 | .118 | .603 | .036 | .048 | .189 | 3.329 | 286 | .001 |
| Pair 3 | intent1 - intent3 | -.181 | .660 | .039 | -.258 | -.105 | -4.651 | 286 | .000 |

**Exhibit 4.27: Paired Entrepreneurial Intentions Samples Results for $T_1$, $T_2$, & $T_3$ (*Nascent Entrepreneurs*)**

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | intent1 | 4.60 | 393 | 1.721 | .087 |
| | intent2 | 4.89 | 393 | 1.708 | .086 |
| Pair 2 | intent2 | 4.89 | 393 | 1.708 | .086 |
| | intent3 | 4.72 | 393 | 1.814 | .092 |
| Pair 3 | intent1 | 4.60 | 393 | 1.721 | .087 |
| | intent3 | 4.72 | 393 | 1.814 | .092 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | intent1 & intent2 | 393 | .940 | .000 |
| Pair 2 | intent2 & intent3 | 393 | .944 | .000 |
| Pair 3 | intent1 & intent3 | 393 | .927 | .000 |

**Paired Samples Test**

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | | | |
| Pair 1 | intent1 - intent2 | -.293 | .596 | .030 | -.352 | -.233 | -9.730 | 392 | .000 |
| Pair 2 | intent2 - intent3 | .173 | .598 | .030 | .114 | .232 | 5.735 | 392 | .000 |
| Pair 3 | intent1 - intent3 | -.120 | .680 | .034 | -.187 | -.052 | -3.485 | 392 | .001 |

**Exhibit 4.28: Paired Entrepreneurial Intentions Samples Results for $T_1$, $T_2$, & $T_3$ (*Non-Entrepreneurs*)**

Exhibit 4.29 provides a comparative graph of the Entrepreneurial Intention means for the Nascent Entrepreneur versus Non-Entrepreneur Groups respectively.

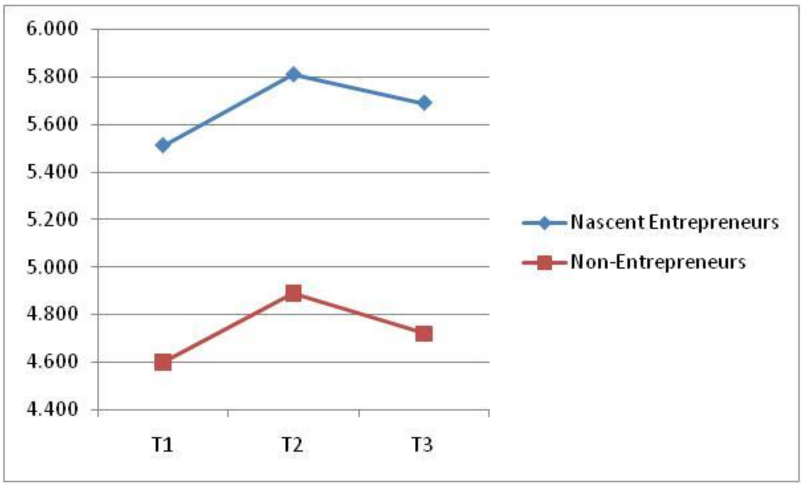



**Exhibit 4.29: Entrepreneurial Intention Means Graphed at $T_1$, $T_2$, & $T_3$ (*Nascent* versus *Non-Entrepreneurs*)**

Exhibit 4.30 provides the results of a series of t-tests that compare the means of Entrepreneurial Intention at $T_1$, $T_2$, and $T_3$ for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

**Group Statistics**

| | entornot | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| intent1 | 1 | 287 | 5.51 | .848 | .050 |
| | 2 | 106 | 2.11 | .760 | .074 |
| intent2 | 1 | 287 | 5.81 | .852 | .050 |
| | 2 | 106 | 2.39 | .508 | .049 |
| intent3 | 1 | 287 | 5.69 | .867 | .051 |
| | 2 | 106 | 2.07 | .734 | .071 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| intent1 | Equal variances assumed | 5.056 | .025 | 36.233 | 391 | .000 | 3.399 | .094 | 3.215 | 3.583 |
| | Equal variances not assumed | | | 38.110 | 207.677 | .000 | 3.399 | .089 | 3.223 | 3.575 |
| intent2 | Equal variances assumed | 15.331 | .000 | 38.872 | 391 | .000 | 3.425 | .088 | 3.252 | 3.598 |
| | Equal variances not assumed | | | 48.580 | 312.545 | .000 | 3.425 | .071 | 3.286 | 3.564 |
| intent3 | Equal variances assumed | 7.351 | .007 | 38.295 | 391 | .000 | 3.627 | .095 | 3.441 | 3.814 |
| | Equal variances not assumed | | | 41.339 | 219.760 | .000 | 3.627 | .088 | 3.454 | 3.800 |

**Exhibit 4.30: T-Test Results for Entrepreneurial Intention at $T_1$, $T_2$, & $T_3$**
**(*Nascent* versus *Non-Entrepreneurs*)**

In examining the Sig (2-Tailed) values appearing in Exhibit 4.30, there are significant Entrepreneurial Intention mean differences between the Nascent and Non-Entrepreneur Groups at $T_1$, $T_2$, and $T_3$ ($p<0.001$).

## 2.4 Business Start-Up Behaviour

This section presents the results of a preliminary analysis of the Business Start-Up Behaviour variable. Business Start-Up Behaviour was measured in terms of a participant's progress in getting his/her business started. The Business Start-Up Behaviour measurement was taken at $T_3$ because no progress was made by participants in starting their businesses at $T_1$ or $T_2$. Exhibits 4.31 and 4.32 present the Business Start-Up Behaviour dimension mean and standard deviation at $T_3$ for the Nascent Entrepreneur Group (n = 287) and Non-Entrepreneur Group (n = 106) respectively.

| Business Start-Up Dimension | $T_1$ Mean (SD) | $T_2$ Mean (SD) | $T_3$ Mean (SD) |
|---|---|---|---|
| **Operate Business** | 0 | 0 | 4.94 (1.350) |

**Exhibit 4.31: Business Start-Up Behaviour Mean and SD at $T_3$ (*Nascent Entrepreneurs*)**

| Business Start-Up Dimension | $T_1$ Mean (SD) | $T_2$ Mean (SD) | $T_3$ Mean (SD) |
|---|---|---|---|
| **Operate Business** | 0 | 0 | 2.42 (0.567) |

**Exhibit 4.32: Business Start-Up Behaviour Mean and SD at $T_3$ (*Non-Entrepreneurs*)**

Exhibits 4.33 and 4.34 provide graphs of the Business Start-Up Behaviour means for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

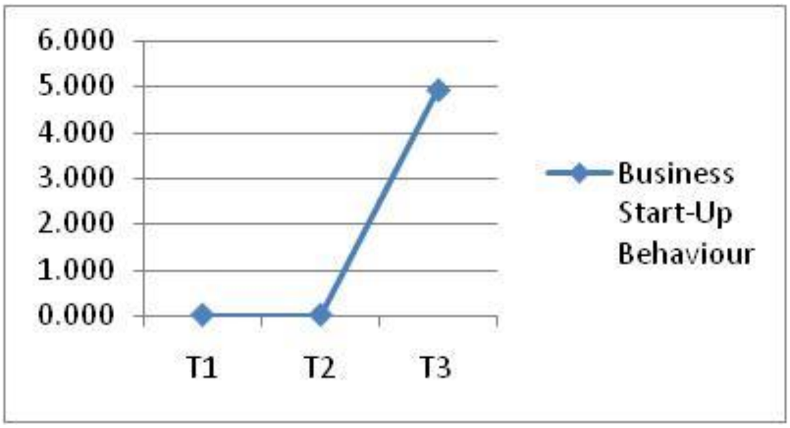



**Exhibit 4.33: Business Start-Up Behaviour Means Graphed at $T_1$, $T_2$, & $T_3$ (*Nascent Entrepreneurs*)**

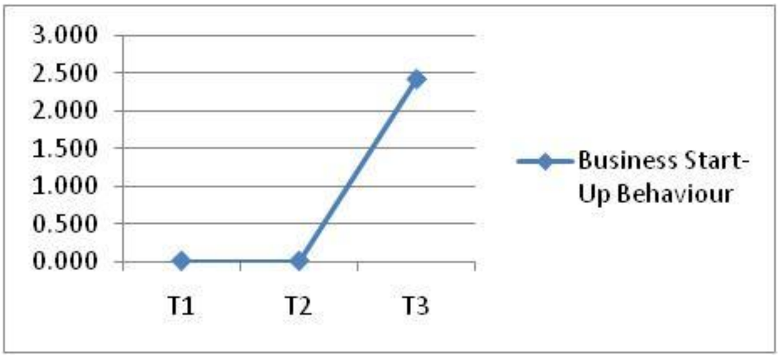



**Exhibit 4.34: Business Start-Up Behaviour Means Graphed at $T_1$, $T_2$, & $T_3$ (*Non-Entrepreneurs*)**

Exhibit 4.35 provides a comparative graph of the business start-up behaviour means for the Nascent Entrepreneur versus Non-Entrepreneur Groups respectively.

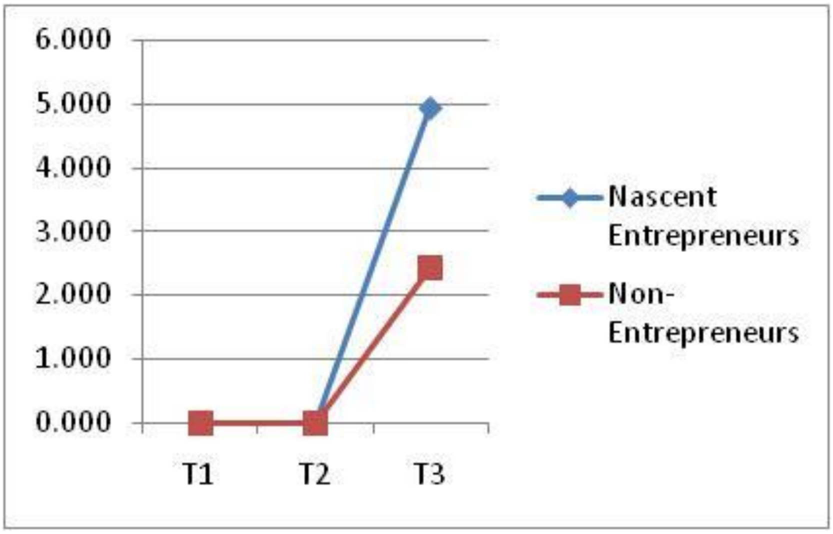



**Exhibit 4.35: Business Start-Up Behaviour Means Graphed at $T_1$, $T_2$, & $T_3$**
**(*Nascent* vs *Non-Entrepreneurs*)**

Exhibit 4.36 provides the results of a series of t-tests that compare the means of Business Start-Up Behaviour at $T_3$ for the Nascent Entrepreneur and Non-Entrepreneur Groups respectively.

**Group Statistics**

| | entornot | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| operbiz | 1 | 287 | 4.94 | 1.350 | .080 |
| | 2 | 106 | 2.42 | .567 | .055 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| operbiz | Equal variances assumed | 83.532 | .000 | 18.680 | 391 | .000 | 2.529 | .135 | 2.263 | 2.795 |
| | Equal variances not assumed | | | 26.114 | 385.152 | .000 | 2.529 | .097 | 2.339 | 2.720 |

**Exhibit 4.36: T-Test Results for Business Start-Up Behaviour at $T_1$, $T_2$, & $T_3$**
**(*Nascent* vs *Non-Entrepreneurs*)**

In examining the Sig (2-Tailed) values appearing in Exhibit 4.36, there is a significant Start-Up Behaviour mean difference between the Nascent and Non-Entrepreneur Groups at $T_3$ ($p<0.001$).

## 3.0 Advanced Data Analyses

The more advanced data analyses involved a number of different procedures that primarily relied on using the Structural Equation Modeling package, AMOS. These included … checking for multivariate normality, undertaking one factor congeneric analyses (confirmatory factor analyses), undertaking discriminant analyses, and invariance testing of the two groups). The results of the analysis of the full structural model including testing group membership as a moderating variable appear in Chapter 5.

### 3.1 Assessing Multivariate Normality

Tests were undertaken for multivariate normality for each of the distributions being examined. This was important since an underlying assumption of structural equation modeling is multivariate normality. In this regard, Mardia's coefficient (Mardia, 1970, 1974) was calculated. Appearing in Exhibits 4.37 and 4.38 are the results of the tests for the Nascent Entrepreneur and Non-Entrepreneur Groups. Mardia's coefficient values of 3.00 or more suggest there may be a need for concern (Wothke, 1996). Values of zero suggest a normal distribution. As can be seen from the Exhibits, non-normality is present in a number of the variables. This suggests that instead of using the $\chi^2$ index, the Bollen-Stine p is more suitable for evaluating model fit.

### 3.2 Confirmatory Factor Analyses of One Factor Congeneric Measurement Models

The following sections present the one-factor congeneric measurement model results for the Values and Entrepreneurial Attitude constructs. These are displayed by group in terms of the points in time when the data was collected - $T_1$, $T_2$, and $T_3$.

For brevity purposes, the results of the Values construct analyses for $T_2$ and $T_3$ do not appear in this Chapter; they appear in Appendix 4. Because there were no significant differences between the means of the Values construct dimensions at $T_1$, $T_2$, and $T_3$, only the Values construct results for $T_1$ were used in the full structural model. However, for completeness purposes, the one-factor congeneric measurement model analyses results for the Values construct data collected at $T_2$ and $T_3$ are reported.

The results of the analyses for the Entrepreneurial Attitude and Entrepreneurial Intentions constructs for all three points of data collection ($T_1$, $T_2$, and $T_3$) and Business Start-Up Behaviour ($T_3$) appear in this Chapter since these all feature in the full structural model. In all cases, the latent variable variance was set to "1" to allow for examination of all factor loadings and their significance. Using Maximum Likelihood (ML) Estimates, AMOS was used to run the one factor congeneric measurement models. Outputs generated included:

- Regression weights including standardised regression weights
- Variances
- Squared multiple correlations
- Implied covariances and Implied correlations
- Residual covariances including standardised residual covariances
- Factor score weights, and
- Modification indices.

For brevity reasons, not all the AMOS outputs are reported. The one-factor congeneric model results for the *Nascent Entrepreneur Group* are presented in the next section. The one-factor congeneric model results for the *Non-Entrepreneur Group* are presented in the section following this. .

| **Construct Factor Details*** | **Mardia's coefficient Results (Critical Ratio - c.r.)** | **Testing the null hypothesis that the model is correct: Chi-square (Bollen-Stine bootstrap p value)** | **Model Specification Assessment based on Bollen-Stine p (only)**** |
|---|---|---|---|
| Values-External @ $T_1$ | 3.088 (3.775) | 0.346 (0.425) | Data fits the Model |
| Values-External @ $T_2$ | 0.361 (0.442) | 0.786 (0.793) | Data fits the Model |
| Values-External @ $T_3$ | 3.425 (4.187) | 0.516 (0.683) | Data fits the Model |
| Values-Interpersonal @ $T_1$ (paired with External Values)* | 2.396 (2.072) | 0.959 (0.963) | Data fits the Model |
| Values-Interpersonal @ $T_2$ (paired with External Values)* | 0.810 (0.700) | 0.979 (0.983) | Data fits the Model |
| Values-Interpersonal @ $T_3$ (paired with External Values)* | 2.657 (2.297) | 0.978 (0.986) | Data fits the Model |
| Values-Internal @ $T_1$ (paired with External Values)* | 4.994 (3.769) | 0.830 (0.862) | Data fits the Model |
| Values- Internal @ $T_2$ (paired with External Values)* | 1.735 (1.310) | 0.988 (0.987) | Data fits the Model |
| Values- Internal @ $T_3$ (paired with External Values)* | 4.961 (3.743) | 0.646 (0.733) | Data fits the Model |
| Entrepreneurial Attitude- @ $T_1$ | 4.384 (3.308) | 0.399 (0.476) | Data fits the Model |
| Entrepreneurial Attitude- @ $T_2$ | 7.344 (5.542) | 0.960 (0.979) | Data fits the Model |
| Entrepreneurial Attitude- @ $T_3$ | 0.571 (0.431) | 0.977 (0.980) | Data fits the Model |
| Entrepreneurial Intention @ $T_1$ (paired with Entrepreneurial Attitude)* | 3.348 (2.242) | 0.514 (0.572) | Data fits the Model |
| Entrepreneurial Intention @ $T_2$ (paired with Entrepreneurial Attitude)* | 6.898 (4.620) | 0.918 (0.939) | Data fits the Model |
| Entrepreneurial Intention @ $T_3$ (paired with Entrepreneurial Attitude)* | 1.21 (0.817) | 0.786 (0.806) | Data fits the Model |
| Business Start-Up Behaviour @ $T_3$ (paired with Entrepreneurial Attitude)* | 0.621 (0.416) | 0.374 (0.428) | Data fits the Model |

* *Note*: Where a construct dimension has less than four indicator items, to permit analysis, the construct dimension is paired with another construct dimension to increase the degrees of freedom.

** *Note*: Additional model fit statistics are calculated below.

**Exhibit 4.37: Results of Tests for Non-Normality at $T_1$, $T_2$, & $T_3$**
**(*Nascent Entrepreneurs*)**

| Construct Factor Details* | Mardia's coefficient Results (Critical Ratio - c.r.) | Testing the null hypothesis that the model is correct: Chi-square (Bollen-Stine bootstrap p value) | Model Specification Assessment based on Bollen-Stine p (only)** |
|---|---|---|---|
| Values-External @ $T_1$ | 2.947 (2.190) | 0.446 (0.552) | Data fits the Model |
| Values-External @ $T_2$ | 2.761 (2.052) | 0.862 (0.885) | Data fits the Model |
| Values-External @ $T_3$ | 1.165 (0.865) | 0.930 (0.920) | Data fits the Model |
| Values-Interpersonal @ $T_1$ (paired with External Values)* | 5.168 (2.715) | 0.923 (0.916) | Data fits the Model |
| Values-Interpersonal @ $T_2$ (paired with External Values)* | 5.342 (2.807) | 0.996 (0.998) | Data fits the Model |
| Values-Interpersonal @ $T_3$ (paired with External Values)* | 2.931 (1.540) | 0.999 (0.998) | Data fits the Model |
| Values-Internal @ $T_1$ (paired with External Values)* | 10.497 (4.814) | 0.997 (0.996) | Data fits the Model |
| Values- Internal @ $T_2$ (paired with External Values)* | 5.102 (2.340) | 0.996 (0.995) | Data fits the Model |
| Values- Internal @ $T_3$ (paired with External Values)* | 2.445 (1.121) | 0.999 (0.997) | Data fits the Model |
| Entrepreneurial Attitude- @ $T_1$ | 6.323 (2.900) | 1.000 (1.000) | Data fits the Model |
| Entrepreneurial Attitude- @ $T_2$ | 4.808 (2.205) | 1.000 (1.000) | Data fits the Model |
| Entrepreneurial Attitude- @ $T_3$ | 5.615 (2.575) | 1.000 (1.000) | Data fits the Model |
| Entrepreneurial Intention @ $T_1$ (paired with Entrepreneurial Attitude)* | 6.279 (2.555) | 0.770 (0.777) | Data fits the Model |
| Entrepreneurial Intention @ $T_2$ (paired with Entrepreneurial Attitude)* | 5.498 (2.237) | 1.000 (1.000) | Data fits the Model |
| Entrepreneurial Intention @ $T_3$ (paired with Entrepreneurial Attitude)* | 4.958 (2.018) | 1.000 (1.000) | Data fits the Model |
| Business Start-Up Behaviour @ $T_3$ (paired with Entrepreneurial Attitude)* | 6.875 (2.798) | 1.000 (1.000) | Data fits the Model |

* *Note*: Where a construct dimension has less than four indicator items, the construct dimension is paired with another construct dimension to increase the degrees of freedom for analysis purposes.

** *Note*: Additional model fit statistics are calculated below.

**Exhibit 4.38: Results of Tests for Non-Normality at $T_1$, $T_2$, & $T_3$**
**(*Non-Entrepreneurs*)**

### 3.2.1 *Nascent Entrepreneur Group* One Factor Congeneric Measurement Models

This section presents the results of the analyses for the Nascent Entrepreneur Group one factor congeneric measurement models for the Values construct at $T_1$ and the Entrepreneurial Attitude construct at $T_1$, $T_2$, and $T_3$.

### 3.2.1.1 Values - *Nascent Entrepreneur Group*

The Values construct is comprised of three dimensions – External, Internal, and Interpersonal Values. Following are the results of the analyses for these dimensions that show to what extent the latent variables (underlying construct dimensions) are a function of the observed indicator items (responses to the survey questions).

External Values @ T1 – Nascent Entrepreneur Group

Exhibit 4.39 provides an overview of the one factor congeneric measurement model for the construct, External Values at $T_1$ for the Nascent Entrepreneur Group. There are four indicator items (variable names appear in brackets):

- Sense of Belonging (to be accepted and needed by friends, family, and community) (v1extbe1)
- Warm Relationships with Others (to have close companionship and intimate friendship) (v3extre1)
- Being Well-Respected (to be admired by others and to receive recognition) (v5extre1)
- Security (to be safe and protected from misfortune and attack) (v7extse1).

The latent variable, External Values (measured at $T_1$), is a function of the observed variables: v1extbe1, v3extre1, v5extre1, and v7extse1.

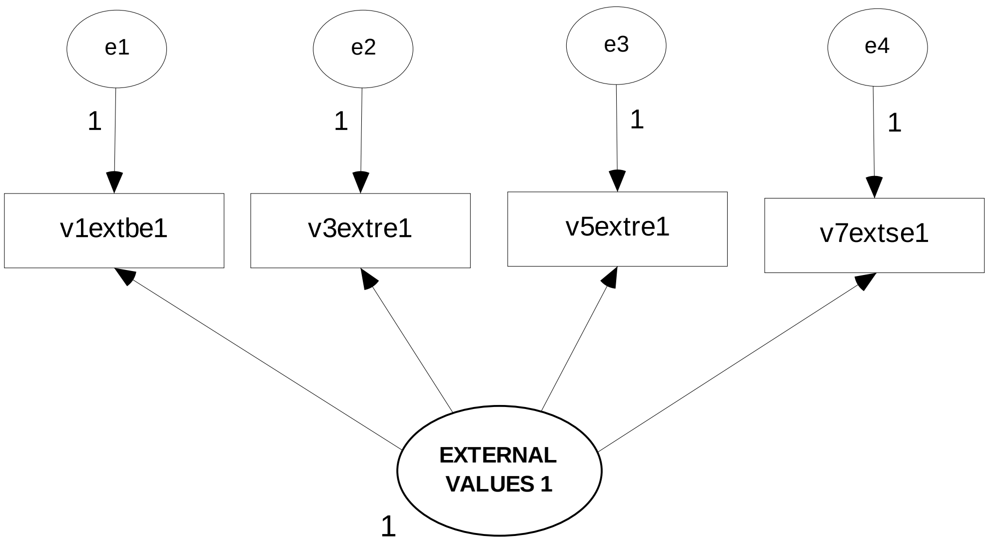



**Exhibit 4.39: One Factor Congeneric Model for External Values at $T_1$**
***(Nascent Entrepreneurs)***

Exhibit 4.40 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for External Values at $T_1$.

The sample correlations ranged from a low of 0.542 to a high of 0.632. These values suggest that item redundancy is not a problem. According to Kline (1979), item inter-correlations that are lower than around 0.3 suggest that each part of a scale might be measuring something different. Correlations greater than 0.70 suggest that a scale may be too narrow and too specific. Where there are pairs of items that are significantly inter-correlated, a scale developer may need to decide whether one item in the pair may need to be eliminated (Robins, Fraley, and Krieger, 2007). The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | v1extbe1 | v3extre1 | v5extre1 | v7extse1 |
|---|---|---|---|---|
| v1extbe1 | 3.141 | | | |
| v3extre1 | 1.913 | 2.918 | | |
| v5extre1 | 1.559 | 1.530 | 2.633 | |
| v7extse1 | 1.806 | 1.603 | 1.466 | 2.711 |

Condition number = 7.449
Eigenvalues
7.821 1.324 1.207 1.050
Determinant of sample covariance matrix = 13.127

**Sample Correlations (Default)**

| | v1extbe1 | v3extre1 | v5extre1 | v7extse1 |
|---|---|---|---|---|
| v1extbe1 | 1.000 | | | |
| v3extre1 | .632 | 1.000 | | |
| v5extre1 | .542 | .552 | 1.000 | |
| v7extse1 | .619 | .570 | .549 | 1.000 |

Condition number = 7.752
Eigenvalues
2.733 .484 .431 .353

**Exhibit 4.40: Sample Covariances, Sample Correlations, and Eigenvalues for the One-Factor Congeneric Model for External Values at $T_1$**
***(Nascent Entrepreneurs)***

Exhibit 4.41 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for External Values at $T_1$. As can be seen from the Regression Weights[9], all of the four observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the External Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights[10] (with a mean of zero and a standardised deviation of one) range from 0.700 to 0.805. These represent the correlations

[9] AMOS refers to the factor loadings as regression weights.

[10] AMOS refers to the standardised factor loadings as standardised regression weights.

between each item and the External Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.490 to 0.648.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v3extre1 | <--- | EXTERNAL_VALUES1 | 1.164 | .103 | 11.314 | *** | b |
| v1extbe1 | <--- | EXTERNAL_VALUES1 | 1.256 | .108 | 11.620 | *** | a |
| v5extre1 | <--- | EXTERNAL_VALUES1 | 1.000 | | | | |
| v7extse1 | <--- | EXTERNAL_VALUES1 | 1.103 | .099 | 11.169 | *** | c |

**Standardized Regression Weights: (Default - Default model)**

| | | | Estimate |
|---|---|---|---|
| v3extre1 | <--- | EXTERNAL_VALUES1 | .774 |
| v1extbe1 | <--- | EXTERNAL_VALUES1 | .805 |
| v5extre1 | <--- | EXTERNAL_VALUES1 | .700 |
| v7extse1 | <--- | EXTERNAL_VALUES1 | .761 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v1extbe1 | .648 |
| v3extre1 | .599 |
| v5extre1 | .490 |
| v7extse1 | .579 |

**Exhibit 4.41: Scalars for External Values at $T_1$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 4.42 presents the Nascent Entrepreneur Group Model Fit statistics for External Values at $T_1$. These indicate to what extent the model "fits" the data. To the extent that they are within the acceptable levels, the greater the model fit. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the External Values construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 2.122 with 2df and p = 0.346 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0113 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.015<br>PCLOSE = 0.568<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 0.999 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.42: Model Fit Statistics for External Values at $T_1$**
**(*Nascent Entrepreneurs*)**

**Interpersonal Values @ $T_1$ – *Nascent Entrepreneur Group***

Exhibit 4.43 provides an overview of the one factor congeneric measurement model for the construct, Interpersonal Values at $T_1$ for the Nascent Entrepreneur Group. There are two indicator items (variable names appear in brackets):

- Excitement (to experience stimulation and thrills) (v2funex1)
- Fun and Enjoyment in Life (to lead a pleasurable happy life) (v6funfu1)

The latent variable, Interpersonal Values (measured at $T_1$), is a function of the observed variables: v2funex1 and v6funfu1.

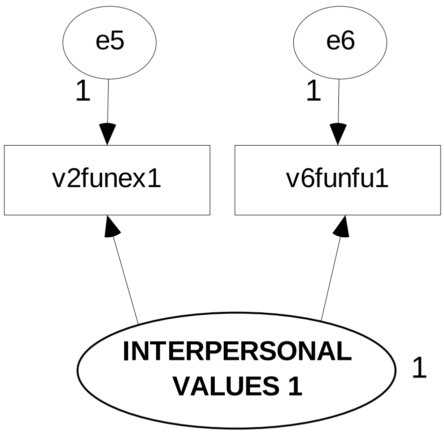



**Exhibit 4.43: One Factor Congeneric Model for Interpersonal Values at $T_1$**
***(Nascent Entrepreneurs)***

Because the Interpersonal Values construct has less than four observed items, a one-factor congeneric measurement model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric measurement model have been correctly specified, the Interpersonal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 4.44.

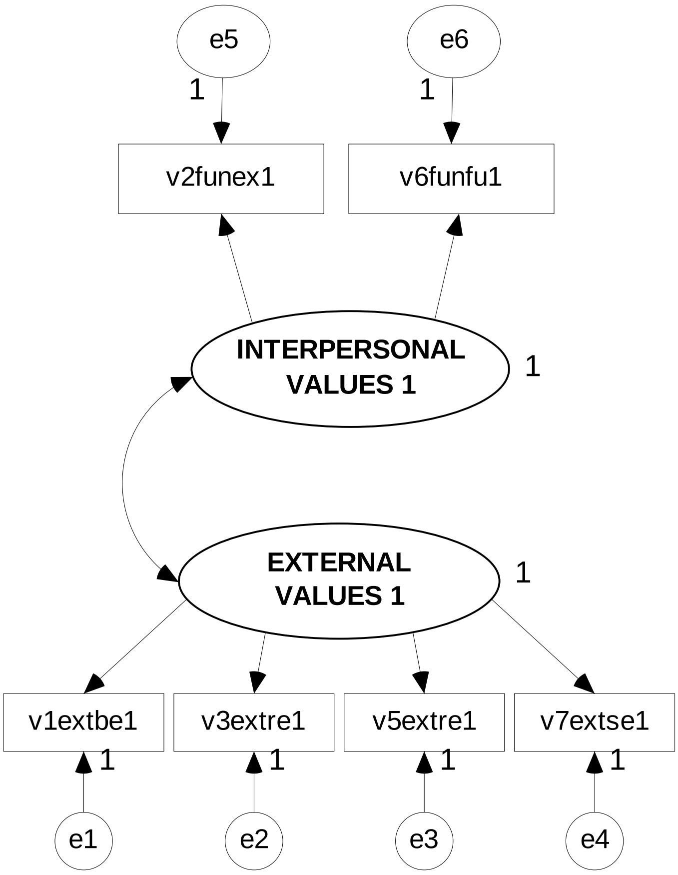



**Exhibit 4.44: Paired One Factor Congeneric Model for Interpersonal & External Values at $T_1$**
***(Nascent Entrepreneurs)***

Exhibit 4.45 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Interpersonal Values and External Values at $T_1$. The sample correlations between the observed items for the Interpersonal Values and External Values constructs ranged from 0.119 to 0.159. The correlation between the Interpersonal Values construct items was 0.636 and the correlations between the External Values construct items ranged from 0.542 to 0.632.

The Interpersonal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Interpersonal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v7extse1 | v1extbe1 | v3extre1 | v5extre1 | v2funex1 | v6funfu1 |
|---|---|---|---|---|---|---|
| v7extse1 | 2.711 | | | | | |
| v1extbe1 | 1.806 | 3.141 | | | | |
| v3extre1 | 1.603 | 1.913 | 2.918 | | | |
| v5extre1 | 1.466 | 1.559 | 1.530 | 2.633 | | |

| | v7extse1 | v1extbe1 | v3extre1 | v5extre1 | v2funex1 | v6funfu1 |
|---|---|---|---|---|---|---|
| v2funex1 | .404 | .361 | .368 | .318 | 2.717 | |
| v6funfu1 | .434 | .447 | .428 | .364 | 1.737 | 2.750 |

Condition number = 8.252
Eigenvalues 8.154 4.140 1.325 1.207 1.055 .988
Determinant of sample covariance matrix = 56.292

**Sample Correlations (Default)**

| | v7extse1 | v1extbe1 | v3extre1 | v5extre1 | v2funex1 | v6funfu1 |
|---|---|---|---|---|---|---|
| v7extse1 | 1.000 | | | | | |
| v1extbe1 | .619 | 1.000 | | | | |
| v3extre1 | .570 | .632 | 1.000 | | | |
| v5extre1 | .549 | .542 | .552 | 1.000 | | |
| v2funex1 | .149 | .124 | .131 | .119 | 1.000 | |
| v6funfu1 | .159 | .152 | .151 | .135 | .636 | 1.000 |

Condition number = 8.192
Eigenvalues 2.861 1.508 .484 .431 .367 .349

**Exhibit 4.45: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Interpersonal (and External) Values at $T_1$** ***(Nascent Entrepreneurs)***

Exhibit 4.46 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Interpersonal Values and External Values at $T_1$. As can be seen from the Regression Weights, the two Interpersonal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore both Interpersonal Values indicator items significantly contribute toward the variance of the Interpersonal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights for Interpersonal Values range from 0.743 to 0.855 (and External Values from 0.700 to 0.804). These represent the correlations between each item and the Interpersonal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Interpersonal Values items ranges from 0.553 to 0.731 (and for External Values 0.490 to 0.646).

**Regression Weights (Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | 1.136 | .090 | 12.628 | *** | par_1 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | 1.322 | .092 | 14.431 | *** | par_2 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | 1.425 | .094 | 15.197 | *** | par_3 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES 1 | 1.418 | .225 | 6.292 | *** | par_5 |
| v2funex1 | <--- | INTERPERSONAL_VALUES 1 | 1.225 | .201 | 6.108 | *** | par_6 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | 1.255 | .089 | 14.138 | *** | par_7 |

**Standardized Regression Weights (Default)**

| | | | Estimate |
|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | .700 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | .774 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | .804 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES 1 | .855 |
| v2funex1 | <--- | INTERPERSONAL_VALUES 1 | .743 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | .762 |

**Squared Multiple Correlations (Default)**

| | Estimate |
|---|---|
| v7extse1 | .581 |
| v1extbe1 | .646 |
| v3extre1 | .599 |
| v5extre1 | .490 |
| v2funex1 | .553 |
| v6funfu1 | .731 |

**Correlations (Default)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 1 | <--> | INTERPERSONAL_VALUES 1 | .230 |

**Exhibit 4.46: Scalars for Interpersonal Values at $T_1$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Interpersonal Values and External Values at $T_1$ for the Nascent Entrepreneur Group is 0.230. To calculate the extent to which the Interpersonal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 4.47. Inspection of the structure coefficients for both the Interpersonal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| | **Interpersonal Values1** | | **External Values1** | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre1 | 0* | 0.161 | 0.700 | **0.700** |
| v3extre1 | 0* | 0.178 | 0.774 | **0.774** |
| v1extbe1 | 0* | 0.185 | 0.804 | **0.804** |
| v6funfu1 | 0.855 | **0.855** | 0* | 0.197 |
| v2funex1 | 0.743 | **0.743** | 0* | 0.171 |
| v7extse1 | 0* | 0.175 | 0.762 | **0.762** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.47: Factor Pattern and Structure Coefficients for Interpersonal Values & External Values @ $T_1$ for the *Nascent Entrepreneur s* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 4.48 presents the Nascent Entrepreneur Group Model Fit statistics for the Interpersonal and External Values measurement model at $T_1$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Interpersonal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Interpersonal Values construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 2.557 with 8df and p = 0.959 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0096 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.995<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.017 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.48: Model Fit Statistics for Interpersonal & External Values Measurement Model at $T_1$ (*Nascent Entrepreneurs*)**

### Internal Values @ $T_1$ – *Nascent Entrepreneur Group*

Exhibit 4.49 provides an overview of the one factor congeneric measurement model for the construct, Internal Values, at $T_1$ for the Nascent Entrepreneur Group. There are three indicator items (variable names appear in brackets):

- Self-Fulfilment (to find peace of mind and to make the best use of my talents) (v4intfu1)
- Self-Respect (to be proud of myself and confident of who I am) (v8intre1)
- A Sense of Accomplishment (to succeed at what I want to do) (v9intac1)

The latent variable, Internal Values (measured at $T_1$), is a function of the observed variables: v4intfu1, v8intre1, and v9intac1.

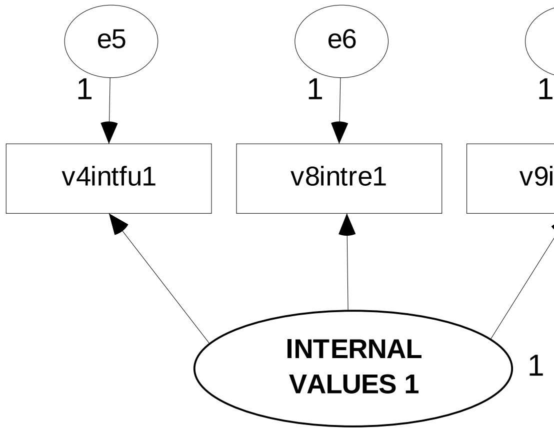



**Exhibit 4.49: One Factor Congeneric Model for Internal Values at $T_1$**
***(Nascent Entrepreneurs)***

Because the Internal Values construct has less than four observed items, a one-factor congeneric measurement model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Internal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 4.50.

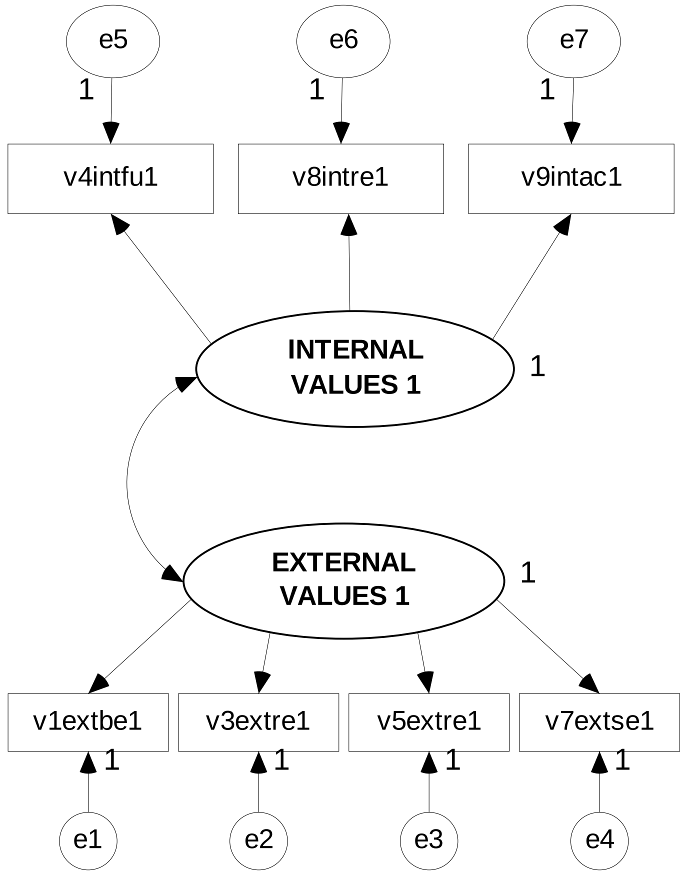



**Exhibit 4.50: Paired One Factor Congeneric Model for Internal Values & External Values at $T_1$**
***(Nascent Entrepreneurs)***

Exhibit 4.51 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Internal Values and External Values at $T_1$. The sample correlations between the observed items for the Internal Values and External Values constructs ranged from 0.157 to 0.223. The correlation between the Internal Values construct items ranged from 0.503 to 0.575 and the correlations between the External Values construct items ranged from 0.542 to 0.632.

The Internal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Internal Values is comprised of one factor.

**Sample Covariances (Group number 1)**

| | v9intac1 | v7extse1 | v1extbe1 | v3extre1 | v5extre1 | v4intfu1 | v8intre1 |
|---|---|---|---|---|---|---|---|
| v9intac1 | 3.353 | | | | | | |
| v7extse1 | .566 | 2.711 | | | | | |
| v1extbe1 | .554 | 1.806 | 3.141 | | | | |
| v3extre1 | .568 | 1.603 | 1.913 | 2.918 | | | |
| v5extre1 | .474 | 1.466 | 1.559 | 1.530 | 2.633 | | |
| v4intfu1 | 1.841 | .636 | .631 | .470 | .627 | 3.054 | |
| v8intre1 | 1.638 | .627 | .650 | .554 | .586 | 1.499 | 2.909 |

Condition number = 8.970
Eigenvalues 9.245 5.035 1.510 1.448 1.285 1.164 1.031
Determinant of sample covariance matrix = 156.992

**Sample Correlations (Group number 1)**

| | v9intac1 | v7extse1 | v1extbe1 | v3extre1 | v5extre1 | v4intfu1 | v8intre1 |
|---|---|---|---|---|---|---|---|
| v9intac1 | 1.000 | | | | | | |
| v7extse1 | .188 | 1.000 | | | | | |
| v1extbe1 | .171 | .619 | 1.000 | | | | |
| v3extre1 | .181 | .570 | .632 | 1.000 | | | |
| v5extre1 | .159 | .549 | .542 | .552 | 1.000 | | |
| v4intfu1 | .575 | .221 | .204 | .157 | .221 | 1.000 | |
| v8intre1 | .525 | .223 | .215 | .190 | .212 | .503 | 1.000 |

Condition number = 9.170
Eigenvalues 3.155 1.651 .509 .494 .447 .400 .344

**Exhibit 4.51: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Internal (and External) Values at $T_1$**
***(Nascent Entrepreneurs)***

Exhibit 4.52 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Internal Values and External Values at $T_1$. As can be seen from the Regression Weights, the Internal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore the Internal Values indicator items significantly contribute toward the variance of the Internal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights for Internal Values range from 0.686 to 0.764 (and External Values from 0.702 to 0.764). These represent the correlations between each item and the Internal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Internal Values items ranges from 0.470 to 0.583 (and for External Values 0.493 to 0.645).

**Regression Weights (Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | 1.139 | .090 | 12.691 | *** | par_1 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | 1.317 | .092 | 14.382 | *** | par_2 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | 1.424 | .094 | 15.203 | *** | par_3 |
| v8intre1 | <--- | INTERNAL_VALUES 1 | 1.169 | .102 | 11.504 | *** | par_5 |
| v4intfu1 | <--- | INTERNAL_VALUES 1 | 1.304 | .104 | 12.566 | *** | par_6 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | 1.258 | .089 | 14.196 | *** | par_7 |
| v9intac1 | <--- | INTERNAL_VALUES 1 | 1.398 | .109 | 12.865 | *** | par_8 |

**Standardized Regression Weights (Default)**

| | | | Estimate |
|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | .702 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | .771 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | .803 |
| v8intre1 | <--- | INTERNAL_VALUES 1 | .686 |
| v4intfu1 | <--- | INTERNAL_VALUES 1 | .746 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | .764 |
| v9intac1 | <--- | INTERNAL_VALUES 1 | .764 |

**Squared Multiple Correlations (Default)**

| | Estimate |
|---|---|
| v9intac1 | .583 |
| v7extse1 | .583 |
| v1extbe1 | .645 |
| v3extre1 | .595 |
| v5extre1 | .493 |
| v4intfu1 | .557 |
| v8intre1 | .470 |

**Correlations**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 1 | <--> | INTERNAL_VALUES 1 | .342 |

**Exhibit 4.52: Scalars for Internal Values at $T_1$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Internal Values and External Values at $T_1$ for the Nascent Entrepreneur Group is 0.342. To calculate the extent to which the Internal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 4.53. Inspection of the structure coefficients for both the Internal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| Indicator Variables | Internal Values1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre1 | 0* | 0.240 | 0.702 | **0.702** |
| v3extre1 | 0* | 0.264 | 0.771 | **0.771** |
| v1extbe1 | 0* | 0.275 | 0.803 | **0.803** |
| v8intre1 | 0.686 | **0.686** | 0* | 0.235 |
| v4intfu1 | 0.746 | **0.746** | 0* | 0.255 |
| v7extse1 | 0* | 0.261 | 0.764 | **0.764** |
| v9intac1 | 0.764 | **0.764** | 0* | 0.261 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.53: Factor Pattern and Structure Coefficients for Internal Values & External Values @ $T_1$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 4.54 presents the Nascent Entrepreneur Group Model Fit statistics for the Internal and External Values measurement model at $T_1$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Internal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Internal Values construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 8.206 with 13df and p = 0.830 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0215 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.987<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.011 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.54: Model Fit Statistics for Internal & External Values Measurement Model at $T_1$ (*Nascent Entrepreneurs*)**

### 3.2.1.2 Entrepreneurial Attitude – *Nascent Entrepreneur Group*

Following are the results of the nascent entrepreneur group analyses for the Entrepreneurial Attitude dimension that show to what extent the latent variable is a function of the observed indicator items (responses to the survey questions).

### Entrepreneurial Attitude @ $T_1$ – *Nascent Entrepreneur Group*

Exhibit 4.55 provides an overview of the one factor congeneric measurement model for the construct, Entrepreneurial Attitude, at $T_1$ for the Nascent Entrepreneur Group. There are seven indicator items for the construct whose variable names are ae4opfo1, ae5oppe1, ae8opco1, ae9opbe1, ae13oppa1, ae14oppe1, and ae15oppi1. Thus, the latent variable, Entrepreneurial Attitude (measured at $T_1$), is a function of these observed variables at $T_1$.

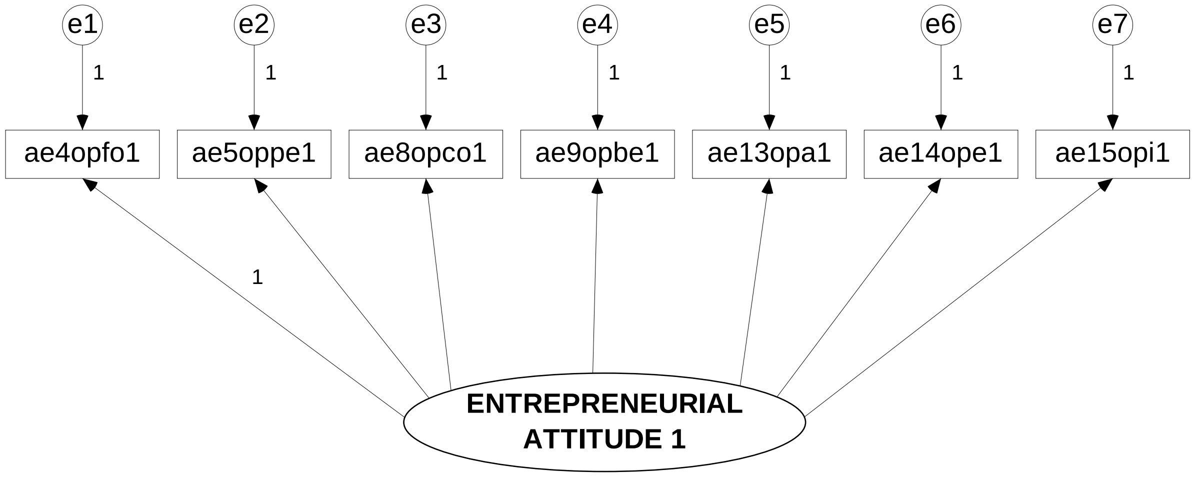



**Exhibit 4.55: One Factor Congeneric Model for Entrepreneurial Attitude at $T_1$**
***(Nascent Entrepreneurs)***

Exhibit 4.56 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for Entrepreneurial Attitude at $T_1$. The sample correlations ranged from a low of 0.455 to a high of 0.615. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | ae15opi1 | ae14ope1 | ae13opa1 | ae9opbe1 | ae8opco1 | ae5oppe1 | ae4opfo1 |
|---|---|---|---|---|---|---|---|
| ae15opi1 | 3.952 | | | | | | |
| ae14ope1 | 2.309 | 3.962 | | | | | |
| ae13opa1 | 1.861 | 2.166 | 3.133 | | | | |
| ae9opbe1 | 1.867 | 2.089 | 1.821 | 3.328 | | | |
| ae8opco1 | 1.872 | 2.120 | 1.783 | 1.906 | 3.197 | | |
| ae5oppe1 | 1.631 | 2.007 | 1.657 | 1.886 | 1.872 | 3.253 | |
| ae4opfo1 | 1.828 | 1.743 | 1.607 | 1.555 | 1.561 | 1.527 | 3.125 |

Condition number = 11.627
Eigenvalues
14.554 2.104 1.751 1.548 1.427 1.316 1.252
Determinant of sample covariance matrix = 195.100

**Sample Correlations (Default)**

| | ae15opi1 | ae14ope1 | ae13opa1 | ae9opbe1 | ae8opco1 | ae5oppe1 | ae4opfo1 |
|---|---|---|---|---|---|---|---|
| ae15opi1 | 1.000 | | | | | | |
| ae14ope1 | .584 | 1.000 | | | | | |
| ae13opa1 | .529 | .615 | 1.000 | | | | |
| ae9opbe1 | .515 | .575 | .564 | 1.000 | | | |
| ae8opco1 | .527 | .596 | .564 | .584 | 1.000 | | |
| ae5oppe1 | .455 | .559 | .519 | .573 | .581 | 1.000 | |
| ae4opfo1 | .520 | .495 | .514 | .482 | .494 | .479 | 1.000 |

Condition number = 11.887
Eigenvalues
4.240 .600 .522 .454 .423 .404 .357

**Exhibit 4.56: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Entrepreneurial Attitude at $T_1$ *(Nascent Entrepreneurs)***

Exhibit 4.57 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for Entrepreneurial Attitude at $T_1$. As can be seen from the Regression Weights, all seven of the observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the Entrepreneurial Attitude factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.663 to 0.787. These represent the correlations between each item and the Entrepreneurial Attitude factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.439 to 0.620.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae4opfo1 | <--- | EAOR1 | 1.172 | .097 | 12.100 | *** | par_1 |
| ae5oppe1 | <--- | EAOR1 | 1.295 | .096 | 13.459 | *** | par_2 |
| ae8opco1 | <--- | EAOR1 | 1.367 | .093 | 14.695 | *** | par_3 |
| ae9opbe1 | <--- | EAOR1 | 1.369 | .096 | 14.309 | *** | par_4 |
| ae13opa1 | <--- | EAOR1 | 1.334 | .093 | 14.406 | *** | par_5 |
| ae14ope1 | <--- | EAOR1 | 1.567 | .102 | 15.339 | *** | par_6 |
| ae15opi1 | <--- | EAOR1 | 1.400 | .107 | 13.117 | *** | par_7 |

**Standardized Regression Weights: (Default - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae4opfo1 | <--- | EAOR1 | .663 |
| ae5oppe1 | <--- | EAOR1 | .718 |
| ae8opco1 | <--- | EAOR1 | .764 |
| ae9opbe1 | <--- | EAOR1 | .750 |
| ae13opa1 | <--- | EAOR1 | .754 |
| ae14ope1 | <--- | EAOR1 | .787 |
| ae15opi1 | <--- | EAOR1 | .704 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| ae15opi1 | .496 |
| ae14ope1 | .620 |
| ae13opa1 | .568 |
| ae9opbe1 | .563 |
| ae8opco1 | .584 |
| ae5oppe1 | .515 |
| ae4opfo1 | .439 |

**Exhibit 4.57: Scalars for Entrepreneurial Attitude at $T_1$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 4.58 presents the Nascent Entrepreneur Group Model Fit statistics for Entrepreneurial Attitude at $T_1$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the Entrepreneurial Attitude construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 13.434 with 14df and p = 0.493 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0194 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.919<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.001 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.58: Model Fit Statistics for Entrepreneurial Attitude at $T_1$**
**(*Nascent Entrepreneurs*)**

### Entrepreneurial Attitude @ $T_2$ – *Nascent Entrepreneur Group*

Exhibit 4.59 provides an overview of the one factor congeneric model for the construct, Entrepreneurial Attitude at $T_2$ for the Nascent Entrepreneur Group. There are seven indicator items for the construct whose variable names are ae4opfo2, ae5oppe2, ae8opco2, ae9opbe2, ae13oppa2, ae14oppe2, and ae15oppi2. Thus, the latent variable, Entrepreneurial Attitude (measured at $T_2$), is a function of these observed variables at $T_2$.

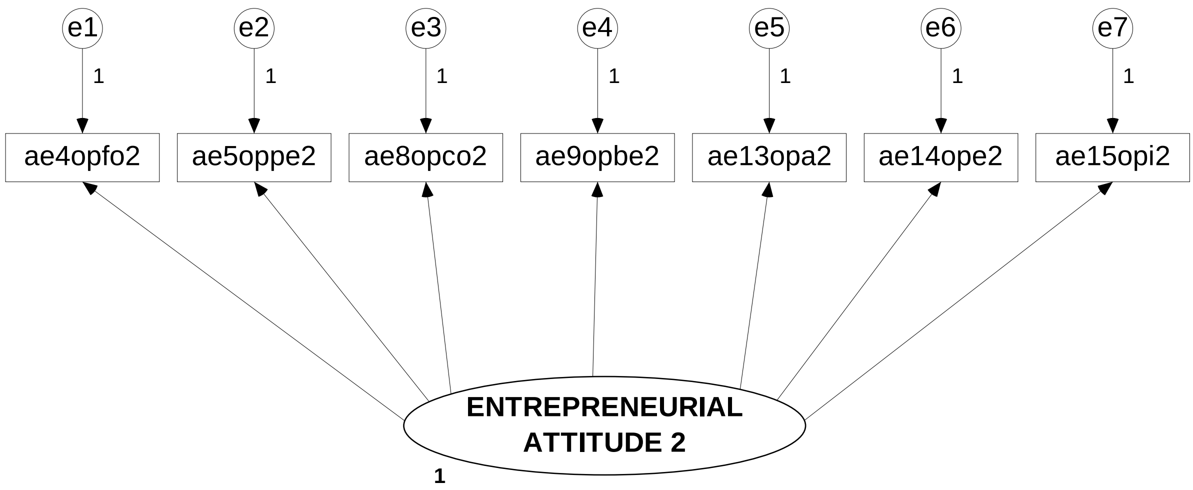



**Exhibit 4.59: One Factor Congeneric Model for Entrepreneurial Attitude at T2 (Nascent Entrepreneurs)**

Exhibit 4.60 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for Entrepreneurial Attitude at $T_2$. The sample correlations ranged from a low of 0.441 to a high of 0.536. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | ae15opi2 | ae14ope2 | ae13opa2 | ae9opbe2 | ae8opco2 | ae5oppe2 | ae4opfo2 |
|---|---|---|---|---|---|---|---|
| ae15opi2 | 3.022 | | | | | | |
| ae14ope2 | 1.437 | 2.657 | | | | | |
| ae13opa2 | 1.491 | 1.424 | 2.880 | | | | |
| ae9opbe2 | 1.331 | 1.237 | 1.373 | 2.446 | | | |
| ae8opco2 | 1.355 | 1.243 | 1.421 | 1.398 | 2.928 | | |
| ae5oppe2 | 1.261 | 1.157 | 1.286 | 1.225 | 1.268 | 2.585 | |
| ae4opfo2 | 1.267 | 1.190 | 1.303 | 1.187 | 1.225 | 1.248 | 2.101 |

Condition number = 10.716
Eigenvalues 10.504 1.691 1.490 1.443 1.323 1.187 .980
Determinant of sample covariance matrix = 58.831

**Sample Correlations (Default)**

| | ae15opi2 | ae14ope2 | ae13opa2 | ae9opbe2 | ae8opco2 | ae5oppe2 | ae4opfo2 |
|---|---|---|---|---|---|---|---|
| ae15opi2 | 1.000 | | | | | | |
| ae14ope2 | .507 | 1.000 | | | | | |
| ae13opa2 | .505 | .515 | 1.000 | | | | |
| ae9opbe2 | .489 | .485 | .517 | 1.000 | | | |
| ae8opco2 | .456 | .445 | .489 | .522 | 1.000 | | |
| ae5oppe2 | .451 | .441 | .471 | .487 | .461 | 1.000 | |
| ae4opfo2 | .503 | .503 | .530 | .524 | .494 | .536 | 1.000 |

Condition number = 8.884
Eigenvalues 3.955 .600 .558 .497 .476 .469 .445

**Exhibit 4.60: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Entrepreneurial Attitude at $T_2$**
***(Nascent Entrepreneurs)***

Exhibit 4.61 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for Entrepreneurial Attitude at $T_2$. As can be seen from the Regression Weights, all seven of the observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the Entrepreneurial Attitude factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.674 to 0.740. These represent the correlations between each item and the Entrepreneurial Attitude factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.454 to 0.547.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae4opfo2 | <--- | EAOR1 | 1.072 | .077 | 13.842 | *** | par_1 |
| ae5oppe2 | <--- | EAOR1 | 1.083 | .089 | 12.207 | *** | par_2 |
| ae8opco2 | <--- | EAOR1 | 1.160 | .094 | 12.311 | *** | par_3 |
| ae9opbe2 | <--- | EAOR1 | 1.128 | .084 | 13.361 | *** | par_4 |
| ae13opa2 | <--- | EAOR1 | 1.227 | .091 | 13.409 | *** | par_5 |
| ae14ope2 | <--- | EAOR1 | 1.119 | .089 | 12.512 | *** | par_6 |
| ae15opi2 | <--- | EAOR1 | 1.199 | .095 | 12.587 | *** | par_7 |

**Standardized Regression Weights: (Default - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae4opfo2 | <--- | EAOR1 | .740 |
| ae5oppe2 | <--- | EAOR1 | .674 |
| ae8opco2 | <--- | EAOR1 | .678 |
| ae9opbe2 | <--- | EAOR1 | .721 |
| ae13opa2 | <--- | EAOR1 | .723 |
| ae14ope2 | <--- | EAOR1 | .686 |
| ae15opi2 | <--- | EAOR1 | .690 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| ae15opi2 | .476 |
| ae14ope2 | .471 |
| ae13opa2 | .522 |
| ae9opbe2 | .520 |
| ae8opco2 | .460 |
| ae5oppe2 | .454 |
| ae4opfo2 | .547 |

**Exhibit 4.61: Scalars for Entrepreneurial Attitude at $T_2$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 4.62 presents the Nascent Entrepreneur Group Model Fit statistics for Entrepreneurial Attitude at $T_2$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the Entrepreneurial Attitude construct dimension at $T_2$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 7.003 with 14df and p = 0.935 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0155 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.997<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.014 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.62: Model Fit Statistics for Entrepreneurial Attitude at $T_2$**
**(*Nascent Entrepreneurs*)**

## Entrepreneurial Attitude @ $T_3$ – *Nascent Entrepreneur Group*

Exhibit 4.63 provides an overview of the one factor congeneric model for the construct, Entrepreneurial Attitude at $T_3$ for the Nascent Entrepreneur Group. There are seven indicator items for the construct whose variable names are ae4opfo3, ae5oppe3, ae8opco3, ae9opbe3, ae13oppa3, ae14oppe3, and ae15oppi3. Thus, the latent variable, Entrepreneurial Attitude (measured at $T_3$), is a function of these observed variables at $T_3$.

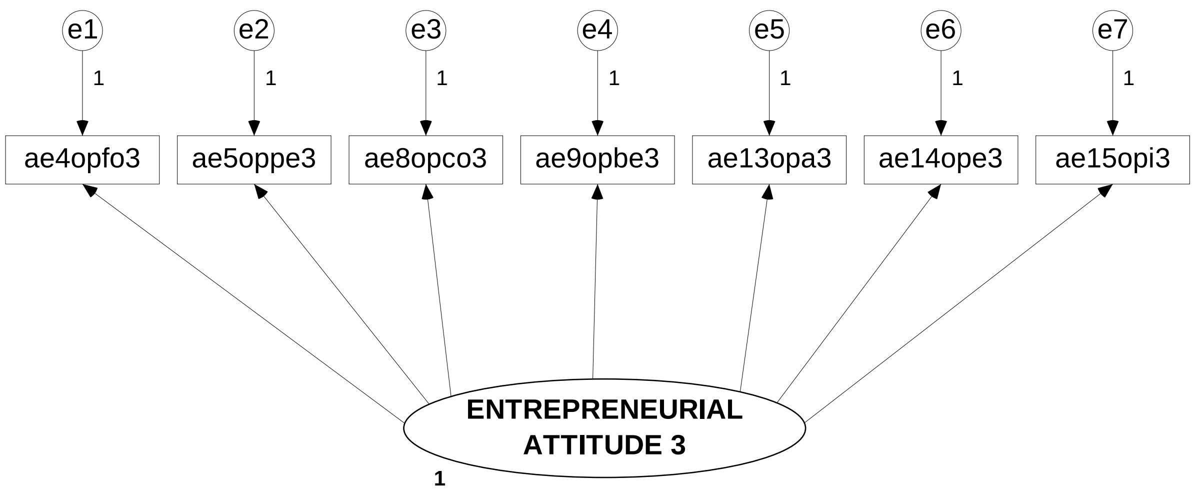



**Exhibit 4.63: One Factor Congeneric Model for Entrepreneurial Attitude at $T_3$**
***(Nascent Entrepreneurs)***

Exhibit 4.64 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for Entrepreneurial Attitude at $T_3$. The sample correlations ranged from a low of 0.402 to a high of 0.535. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 |
|---|---|---|---|---|---|---|---|
| ae15opi3 | 2.736 | | | | | | |
| ae14ope3 | 1.425 | 3.221 | | | | | |
| ae13opa3 | 1.257 | 1.402 | 2.580 | | | | |
| ae9opbe3 | 1.266 | 1.390 | 1.303 | 2.304 | | | |
| ae8opco3 | 1.168 | 1.313 | 1.258 | 1.317 | 3.091 | | |
| ae5oppe3 | 1.151 | 1.213 | 1.164 | 1.197 | 1.176 | 2.547 | |
| ae4opfo3 | 1.221 | 1.232 | 1.170 | 1.183 | 1.164 | 1.219 | 2.103 |

Condition number = 10.342
Eigenvalues
10.175 1.886 1.659 1.458 1.356 1.065 .984
Determinant of sample covariance matrix = 65.907

**Sample Correlations (Default)**

| | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 |
|---|---|---|---|---|---|---|---|
| ae15opi3 | 1.000 | | | | | | |
| ae14ope3 | .480 | 1.000 | | | | | |
| ae13opa3 | .473 | .486 | 1.000 | | | | |
| ae9opbe3 | .504 | .510 | .535 | 1.000 | | | |
| ae8opco3 | .402 | .416 | .446 | .494 | 1.000 | | |
| ae5oppe3 | .436 | .423 | .454 | .494 | .419 | 1.000 | |
| ae4opfo3 | .509 | .473 | .502 | .538 | .456 | .527 | 1.000 |

Condition number = 8.677
Eigenvalues
3.857 .618 .598 .525 .507 .450 .444

**Exhibit 4.64: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Entrepreneurial Attitude at $T_3$**
***(Nascent Entrepreneurs)***

Exhibit 4.65 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for Entrepreneurial Attitude at $T_3$. As can be seen from the Regression Weights, all seven of the observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the Entrepreneurial Attitude factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.629 to 0.753. These represent the correlations between each item and the Entrepreneurial Attitude factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.395 to 0.567.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae4opfo3 | <--- | EAOR3 | 1.062 | .078 | 13.591 | *** | par_1 |
| ae5oppe3 | <--- | EAOR3 | 1.058 | .089 | 11.916 | *** | par_2 |
| ae8opco3 | <--- | EAOR3 | 1.106 | .099 | 11.137 | *** | par_3 |
| ae9opbe3 | <--- | EAOR3 | 1.143 | .081 | 14.137 | *** | par_4 |
| ae13opa3 | <--- | EAOR3 | 1.127 | .088 | 12.838 | *** | par_5 |
| ae14ope3 | <--- | EAOR3 | 1.205 | .099 | 12.112 | *** | par_6 |
| ae15opi3 | <--- | EAOR3 | 1.120 | .091 | 12.245 | *** | par_7 |

**Standardized Regression Weights: (Default - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae4opfo3 | <--- | EAOR3 | .732 |
| ae5oppe3 | <--- | EAOR3 | .663 |
| ae8opco3 | <--- | EAOR3 | .629 |
| ae9opbe3 | <--- | EAOR3 | .753 |
| ae13opa3 | <--- | EAOR3 | .702 |
| ae14ope3 | <--- | EAOR3 | .671 |
| ae15opi3 | <--- | EAOR3 | .677 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| ae15opi3 | .458 |
| ae14ope3 | .451 |
| ae13opa3 | .492 |
| ae9opbe3 | .567 |
| ae8opco3 | .395 |
| ae5oppe3 | .440 |
| ae4opfo3 | .536 |

**Exhibit 4.65: Scalars for Entrepreneurial Attitude at $T_3$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 4.66 presents the Nascent Entrepreneur Group Model Fit statistics for Entrepreneurial Attitude at $T_3$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the Entrepreneurial Attitude construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 5.246 with 14df and p = 0.982 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0138 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.999<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.019 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.66: Model Fit Statistics for Entrepreneurial Attitude at $T_3$**
**(*Nascent Entrepreneurs*)**

### 3.2.2 *Non-Entrepreneur Group* One Factor Congeneric Measurement Models

This section presents the results of the analyses for the Non-Entrepreneur Group one factor congeneric measurement models for the Values construct at $T_1$ and the Entrepreneurial Attitude construct at $T_1$, $T_2$, and $T_3$.

#### 3.2.2.1 Values – Non-Entrepreneur Group

The Values construct for the Non-Entrepreneur Group is comprised of the same three dimensions – External, Internal, and Interpersonal Values – as was for the Nascent Entrepreneur Group. Following are the results of the analyses for these dimensions that show to what extent the latent variables (the underlying construct factors) are a function of the observed indicator items (responses to the survey questions).

**External Values @ $T_1$ – *Non-Entrepreneur Group***

Exhibit 4.67 provides an overview of the one factor congeneric model for the construct, External Values at $T_1$ for the Non-Entrepreneur Group. There are four indicator items (variable names appear in brackets):

- Sense of Belonging (to be accepted and needed by friends, family, and community) (v1extbe1)
- Warm Relationships with Others (to have close companionship and intimate friendship) (v3extre1)
- Being Well-Respected (to be admired by others and to receive recognition) (v5extre1)
- Security (to be safe and protected from misfortune and attack) (v7extse1).

The latent variable, External Values (measured at $T_1$), is a function of the observed variables: v1extbe1, v3extre1, v5extre1, and v7extse1.

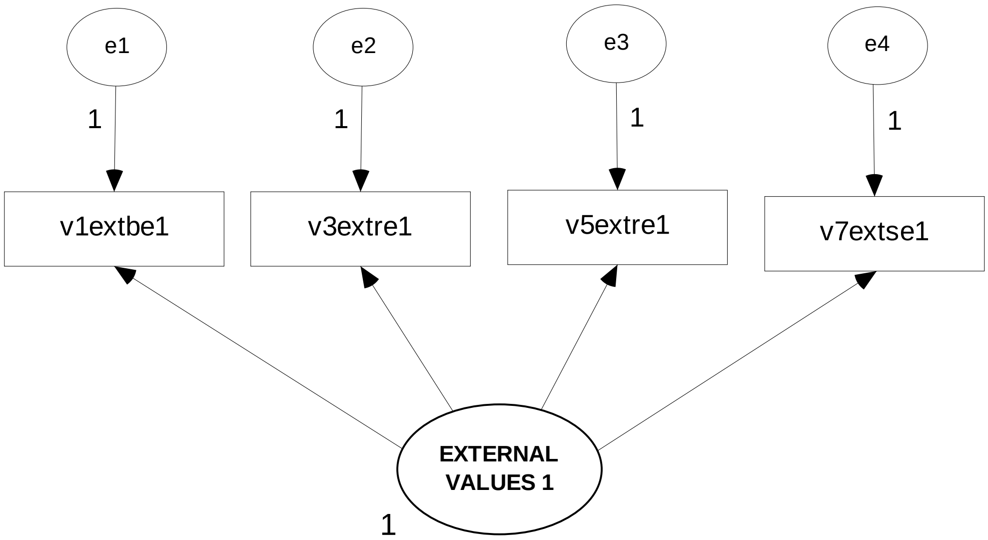



**Exhibit 4.67: One Factor Congeneric Model for External Values at $T_1$**
***(Non-Entrepreneurs)***

Exhibit 4.68 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for External Values at $T_1$. The sample correlations ranged from a low of 0.594 to a high of 0.681. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | v1extbe1 | v3extre1 | v5extre1 | v7extse1 |
|---|---|---|---|---|
| v1extbe1 | 3.169 | | | |
| v3extre1 | 2.165 | 3.187 | | |
| v5extre1 | 2.213 | 2.347 | 4.138 | |
| v7extse1 | 1.778 | 2.031 | 2.210 | 2.830 |

Condition number = 10.817
Eigenvalues
9.772 1.470 1.178 .903
Determinant of sample covariance matrix = 15.294

**Sample Correlations (Default)**

| | v1extbe1 | v3extre1 | v5extre1 | v7extse1 |
|---|---|---|---|---|
| v1extbe1 | 1.000 | | | |
| v3extre1 | .681 | 1.000 | | |
| v5extre1 | .611 | .646 | 1.000 | |
| v7extse1 | .594 | .676 | .646 | 1.000 |

Condition number = 10.048
Eigenvalues
2.928 .418 .363 .291

**Exhibit 4.68: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for External Values at $T_1$**
***(Non-Entrepreneurs)***

Exhibit 4.69 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for External Values at $T_1$. As can be seen from the Regression Weights, all of the four observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the External Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.780 to 0.850. These represent the correlations between each item and the External Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.609 to 0.723.

**Regression Weights (Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v7extse1 | <--- | EXTERNAL_VALUES 1 | 1.336 | .144 | 9.300 | *** | par_1 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | 1.518 | .148 | 10.265 | *** | par_2 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | 1.389 | .153 | 9.077 | *** | par_3 |
| v5extre1 | <--- | EXTERNAL_VALUES 1 | 1.590 | .175 | 9.068 | *** | par_4 |

**Standardized Regression Weights (Default)**

| | | | Estimate |
|---|---|---|---|
| v7extse1 | <--- | EXTERNAL_VALUES 1 | .794 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | .850 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | .780 |
| v5extre1 | <--- | EXTERNAL_VALUES 1 | .781 |

**Squared Multiple Correlations (Default)**

| | Estimate |
|---|---|
| v1extbe1 | .609 |
| v3extre1 | .723 |
| v7extse1 | .631 |
| v5extre1 | .611 |

**Exhibit 4.69: Scalars for External Values at $T_1$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 4.70 presents the Non-Entrepreneur Group Model Fit statistics for External Values at $T_1$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the External Values construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
| --- | --- | --- |
| Chi-square | $\chi^2$ = 1.615 with 2df and p = 0.446 | $p > 0.05$ |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0140 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.533<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.006 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.70: Model Fit Statistics for External Values at $T_1$**
**(*Non-Entrepreneurs*)**

### Interpersonal Values @ $T_1$ – *Non-Entrepreneur Group*

Exhibit 4.71 provides an overview of the one factor congeneric model for the construct, Interpersonal Values at $T_1$ for the Non-Entrepreneur Group.  There are two indicator items (variable names appear in brackets):

- Excitement (to experience stimulation and thrills) (v2funex1)
- Fun and Enjoyment in Life (to lead a pleasurable happy life) (v6funfu1)

The latent variable, Interpersonal Values (measured at $T_1$), is a function of the observed variables:  v2funex1 and v6funfu1.

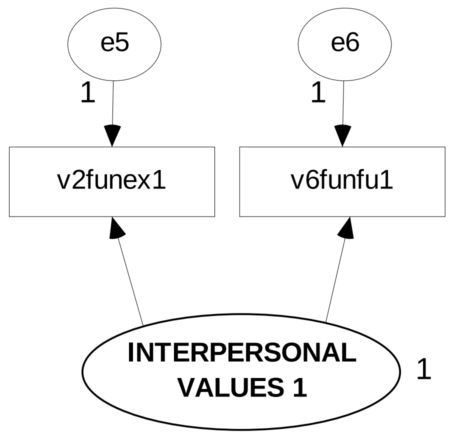



**Exhibit 4.71: One Factor Congeneric Model for Interpersonal Values at $T_1$**
***(Non-Entrepreneurs)***

Because the Interpersonal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed).  To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Interpersonal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 4.72.

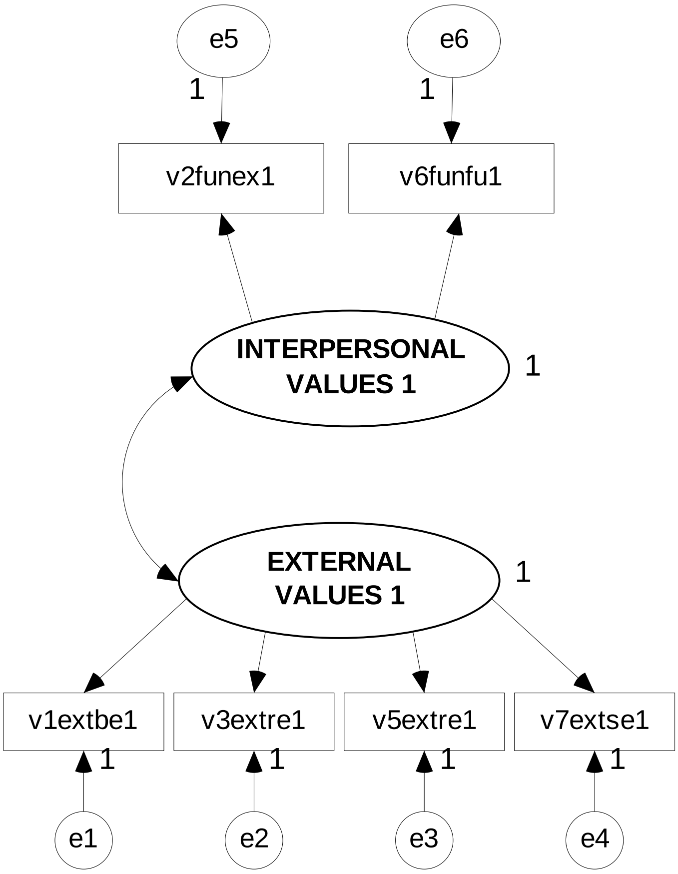



**Exhibit 4.72: Paired One Factor Congeneric Model for Interpersonal Values & External Values at $T_1$** ***(Non-Entrepreneurs)***

Exhibit 4.73 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Interpersonal Values and External Values at $T_1$. The sample correlations between the observed items for the Interpersonal Values and External Values constructs ranged from 0.260 to 0.395. The correlation between the Interpersonal Values construct items was 0.617 and the correlations between the External Values construct items ranged from 0.594 to 0.681.

The Interpersonal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that

External Values is comprised of only one factor, then we can conclude that Interpersonal Values is comprised of one factor.

**Sample Covariances (Group number 1)**

| | v2funex1 | v6funfu1 | v3extre1 | v5extre1 | v7extse1 | v1extbe1 |
|---|---|---|---|---|---|---|
| v2funex1 | 3.354 | | | | | |
| v6funfu1 | 2.042 | 3.262 | | | | |
| v3extre1 | 1.291 | .990 | 3.187 | | | |
| v5extre1 | 1.396 | .983 | 2.347 | 4.138 | | |
| v7extse1 | 1.117 | .791 | 2.031 | 2.210 | 2.830 | |
| v1extbe1 | 1.040 | .942 | 2.165 | 2.213 | 1.778 | 3.169 |

Condition number = 12.636
Eigenvalues
11.329 3.820 1.517 1.273 1.103 .897
Determinant of sample covariance matrix = 82.698

**Sample Correlations (Group number 1)**

| | v2funex1 | v6funfu1 | v3extre1 | v5extre1 | v7extse1 | v1extbe1 |
|---|---|---|---|---|---|---|
| v2funex1 | 1.000 | | | | | |
| v6funfu1 | .617 | 1.000 | | | | |
| v3extre1 | .395 | .307 | 1.000 | | | |
| v5extre1 | .375 | .268 | .646 | 1.000 | | |
| v7extse1 | .363 | .260 | .676 | .646 | 1.000 | |
| v1extbe1 | .319 | .293 | .681 | .611 | .594 | 1.000 |

Condition number = 11.842
Eigenvalues
3.400 1.154 .445 .363 .351 .287

**Exhibit 4.73: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Interpersonal (and External) Values at $T_1$** ***(Non-Entrepreneurs)***

Exhibit 4.74 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Interpersonal Values and External Values at $T_1$. As can be seen from the Regression Weights, the two Interpersonal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore both Interpersonal Values indicator items significantly contribute toward the variance of the Interpersonal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights for Interpersonal Values range from 0.692 to 0.892 (and External Values from 0.777 to 0.852). These represent the correlations between each item and the Interpersonal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$

for each of the Interpersonal Values items ranges from 0.479 to 0.796 (and for External Values 0.604 to 0.726).

**Regression Weights (Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | 1.593 | .174 | 9.150 | *** | par_1 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | 1.521 | .147 | 10.352 | *** | par_2 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | 1.384 | .153 | 9.053 | *** | par_3 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES 1 | 1.250 | .204 | 6.133 | *** | par_5 |
| v2funex1 | <--- | INTERPERSONAL_VALUES 1 | 1.634 | .223 | 7.319 | *** | par_6 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | 1.336 | .143 | 9.337 | *** | par_7 |

**Standardized Regression Weights (Default)**

| | | | Estimate |
|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | .783 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | .852 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | .777 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES 1 | .692 |
| v2funex1 | <--- | INTERPERSONAL_VALUES 1 | .892 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | .794 |

**Squared Multiple Correlations (Default)**

| | Estimate |
|---|---|
| v7extse1 | .631 |
| v1extbe1 | .604 |
| v3extre1 | .726 |
| v5extre1 | .613 |
| v2funex1 | .796 |
| v6funfu1 | .479 |

**Correlations**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 1 | <--> | INTERPERSONAL_VALUES 1 | .509 |

**Exhibit 4.74: Scalars for Interpersonal Values at $T_1$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Interpersonal Values and External Values at $T_1$ for the Non-Entrepreneur Group is 0.509. To calculate the extent to which the Interpersonal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 4.75. Inspection of the structure coefficients for both the Interpersonal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| Indicator Variables | Interpersonal Values1 Pattern | Interpersonal Values1 Structure | External Values1 Pattern | External Values1 Structure |
|---|---|---|---|---|
| v5extre1 | 0* | 0.399 | 0.783 | **0.783** |
| v3extre1 | 0* | 0.434 | 0.852 | **0.852** |
| v1extbe1 | 0* | 0.395 | 0.777 | **0.777** |
| v6funfu1 | 0.692 | **0.692** | 0* | 0.352 |
| v2funex1 | 0.892 | **0.892** | 0* | 0.454 |
| v7extse1 | 0* | 0.404 | 0.794 | **0.794** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.75: Factor Pattern and Structure Coefficients for Interpersonal Values & External Values @ $T_1$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 4.76 presents the Non-Entrepreneur Group Model Fit statistics for the Interpersonal and External Values measurement model at $T_1$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Interpersonal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Interpersonal Values construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 3.173 with 8df and p = 0.923 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0145 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.963<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.033 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.76: Model Fit Statistics for Interpersonal & External Values Measurement Model at $T_1$ (*Non-Entrepreneurs*)**

### Internal Values @ $T_1$ – *Non-Entrepreneur Group*

Exhibit 4.77 provides an overview of the one factor congeneric model for the construct, Internal Values at $T_1$ for the Non-Entrepreneur Group. There are three indicator items (variable names appear in brackets):

- Self-Fulfilment (to find peace of mind and to make the best use of my talents) (v4intfu1)
- Self-Respect (to be proud of myself and confident of who I am) (v8intre1)

- A Sense of Accomplishment (to succeed at what I want to do) (v9intac1)

The latent variable, Internal Values (measured at $T_1$), is a function of the observed variables: v4intfu1, v8intre1, and v9intac1.

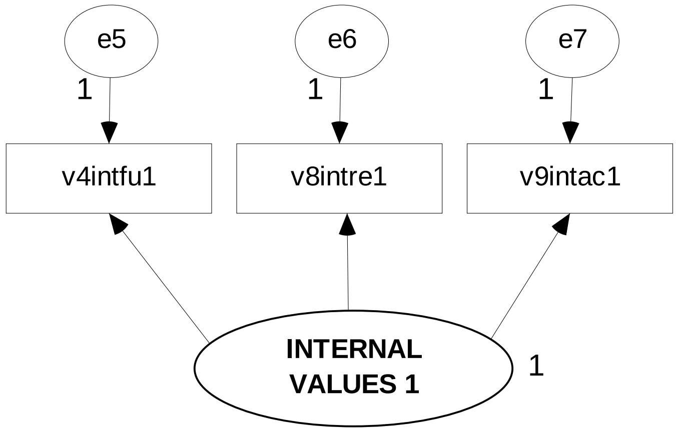



**Exhibit 4.77: One Factor Congeneric Model for Internal Values at $T_1$**
***(Non-Entrepreneurs)***

Because the Internal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Internal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 4.78.

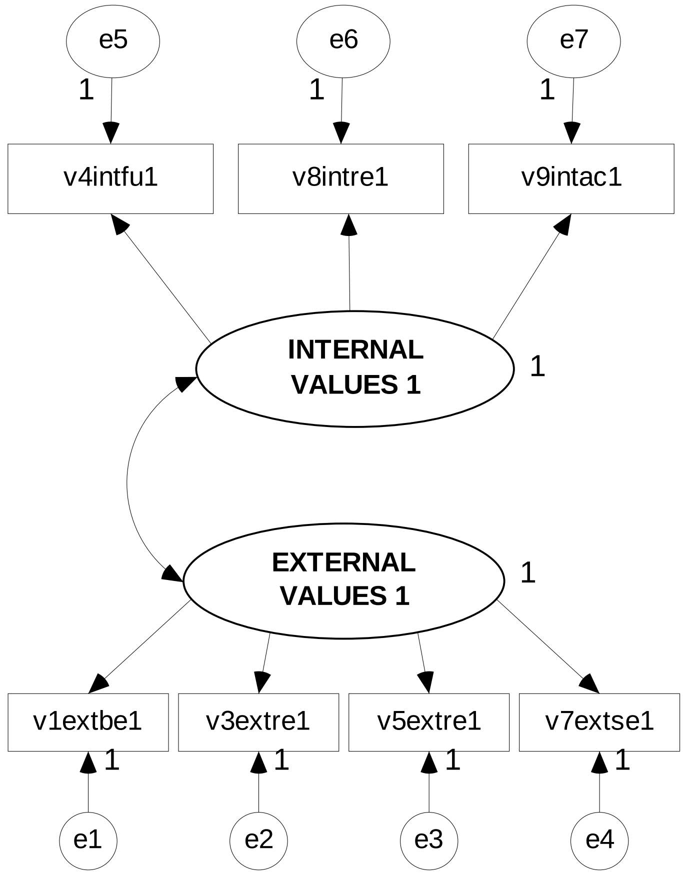



**Exhibit 4.78: Paired One Factor Congeneric Model for Internal Values & External Values at $T_1$ (*Non-Entrepreneurs*)**

Exhibit 4.79 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Internal Values and External Values at $T_1$. The sample correlations between the observed items for the Internal Values and External Values constructs ranged from 0.143 to 0.253. The correlation between the Internal Values construct items ranged from 0.663 to 0.764 and the correlations between the External Values construct items ranged from 0.594 to 0.681.

The Internal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Internal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v9intac1 | v7extse1 | v1extbe1 | v3extre1 | v5extre1 | v4intfu1 | v8intre1 |
|---|---|---|---|---|---|---|---|
| v9intac1 | 3.755 | | | | | | |
| v7extse1 | .470 | 2.830 | | | | | |
| v1extbe1 | .514 | 1.778 | 3.169 | | | | |
| v3extre1 | .544 | 2.031 | 2.165 | 3.187 | | | |
| v5extre1 | .565 | 2.210 | 2.213 | 2.347 | 4.138 | | |
| v4intfu1 | 2.387 | .569 | .681 | .731 | .655 | 3.454 | |
| v8intre1 | 2.564 | .591 | .757 | .876 | .772 | 2.757 | 3.768 |

Condition number = 14.284
Eigenvalues 11.583 7.009 1.497 1.294 1.178 .930 .811
Determinant of sample covariance matrix = 139.640

**Sample Correlations (Default)**

| | v9intac1 | v7extse1 | v1extbe1 | v3extre1 | v5extre1 | v4intfu1 | v8intre1 |
|---|---|---|---|---|---|---|---|
| v9intac1 | 1.000 | | | | | | |
| v7extse1 | .144 | 1.000 | | | | | |
| v1extbe1 | .149 | .594 | 1.000 | | | | |
| v3extre1 | .157 | .676 | .681 | 1.000 | | | |
| v5extre1 | .143 | .646 | .611 | .646 | 1.000 | | |
| v4intfu1 | .663 | .182 | .206 | .220 | .173 | 1.000 | |
| v8intre1 | .682 | .181 | .219 | .253 | .196 | .764 | 1.000 |

Condition number = 14.672
Eigenvalues 3.364 1.975 .423 .366 .351 .292 .229

**Exhibit 4.79: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Internal (and External) Values at $T_1$** ***(Non-Entrepreneurs)***

Exhibit 4.80 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Internal Values and External Values at $T_1$. As can be seen from the Regression Weights, the Internal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore the Internal Values indicator items significantly contribute toward the variance of the Internal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights for Internal Values range from 0.767 to 0.889 (and External Values from 0.780 to 0.852). These represent the correlations between each item and the Internal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Internal Values items ranges from 0.588 to 0.790 (and for External Values 0.608 to 0.727).

**Regression Weights (Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | 1.587 | .175 | 9.081 | *** | par_1 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | 1.522 | .147 | 10.328 | *** | par_2 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | 1.391 | .153 | 9.100 | *** | par_3 |
| v8intre1 | <--- | INTERNAL_VALUES 1 | 1.726 | .159 | 10.861 | *** | par_5 |
| v4intfu1 | <--- | INTERNAL_VALUES 1 | 1.600 | .154 | 10.381 | *** | par_6 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | 1.333 | .144 | 9.291 | *** | par_7 |
| v9intac1 | <--- | INTERNAL_VALUES 1 | 1.486 | .167 | 8.888 | *** | par_8 |

**Standardized Regression Weights (Default)**

| | | | Estimate |
|---|---|---|---|
| v5extre1 | <--- | EXTERNAL_VALUES 1 | .780 |
| v3extre1 | <--- | EXTERNAL_VALUES 1 | .852 |
| v1extbe1 | <--- | EXTERNAL_VALUES 1 | .781 |
| v8intre1 | <--- | INTERNAL_VALUES 1 | .889 |
| v4intfu1 | <--- | INTERNAL_VALUES 1 | .861 |
| v7extse1 | <--- | EXTERNAL_VALUES 1 | .793 |
| v9intac1 | <--- | INTERNAL_VALUES 1 | .767 |

**Squared Multiple Correlations (Default)**

| | Estimate |
|---|---|
| v9intac1 | .588 |
| v7extse1 | .628 |
| v1extbe1 | .610 |
| v3extre1 | .727 |
| v5extre1 | .608 |
| v4intfu1 | .741 |
| v8intre1 | .790 |

**Correlations**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 1 | <--> | INTERNAL_VALUES 1 | .285 |

**Exhibit 4.80: Scalars for Internal Values at $T_1$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Internal Values and External Values at $T_1$ for the Non-Entrepreneur Group is 0.285. To calculate the extent to which the Internal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 4.81. Inspection of the structure coefficients for both the Internal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| Indicator Variables | Internal Values1 Pattern | Internal Values1 Structure | External Values1 Pattern | External Values1 Structure |
|---|---|---|---|---|
| v5extre1 | 0* | 0.222 | 0.780 | **0.780** |
| v3extre1 | 0* | 0.243 | 0.852 | **0.852** |
| v1extbe1 | 0* | 0.223 | 0.781 | **0.781** |
| v8intre1 | 0.889 | **0.889** | 0* | 0.253 |
| v4intfu1 | 0.861 | **0.861** | 0* | 0.245 |
| v7extse1 | 0* | 0.226 | 0.793 | **0.793** |
| v9intac1 | 0.767 | **0.767** | 0* | 0.219 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.81: Factor Pattern and Structure Coefficients for Internal Values & External Values @ $T_1$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 4.82 presents the Non-Entrepreneur Group Model Fit statistics for the Internal and External Values measurement model at $T_1$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Internal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Internal Values construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2 = 3.192$ with 13df and $p = 0.997$ | $p > 0.05$ |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0168 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.999<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.043 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.82: Model Fit Statistics for Internal & External Values Measurement Model at $T_1$ (*Non-Entrepreneurs*)**

### 3.2.2.2 Entrepreneurial Attitude – *Non-Entrepreneur Group*

The Entrepreneurial Attitude construct for the Non-Entrepreneur Group adopted in this research is comprised of one dimension – Opportunity Recognition. Following are the results of the analyses for this dimension that show to what extent the latent variable is a function of the observed indicator items (responses to the survey questions).

**Entrepreneurial Attitude @ $T_1$ – *Non-Entrepreneur Group***

Exhibit 4.83 provides an overview of the one factor congeneric measurement model for the construct, Entrepreneurial Attitude, at $T_1$ for the Non-Entrepreneur Group. There are seven indicator items for the construct whose variable names are ae4opfo1, ae5oppe1, ae8opco1, ae9opbe1, ae13oppa1, ae14oppe1, and ae15oppi1. Thus, the latent variable, Entrepreneurial Attitude (measured at $T_1$), is a function of these observed variables at $T_1$.

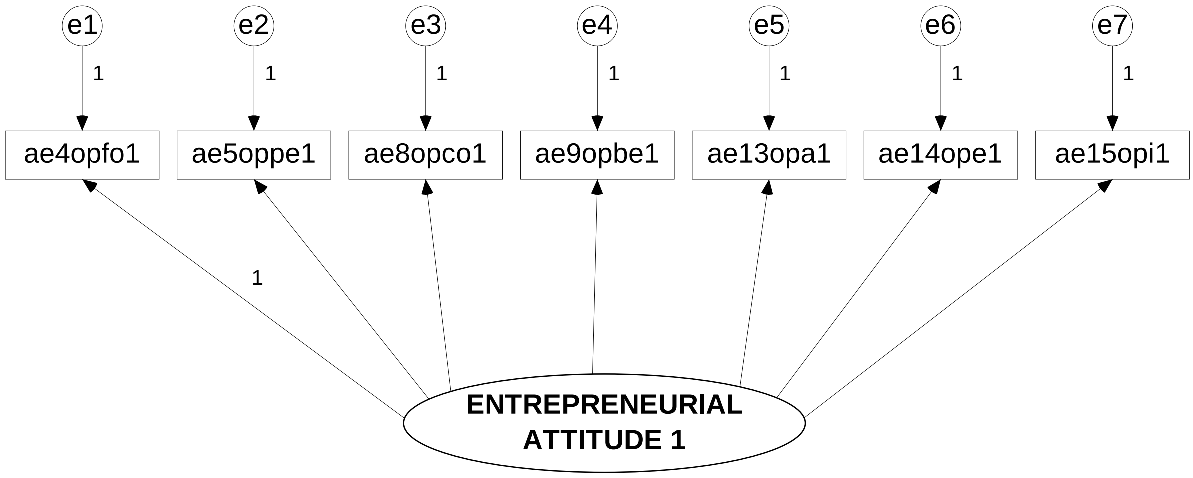



**Exhibit 4.83: One Factor Congeneric Model for Entrepreneurial Attitude at $T_1$**
***(Non-Entrepreneurs)***

Exhibit 4.84 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for Entrepreneurial Attitude at $T_1$. The sample correlations ranged from a low of 0.656 to a high of 0.775. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | ae15opi1 | ae14ope1 | ae13opa1 | ae9opbe1 | ae8opco1 | ae5oppe1 | ae4opfo1 |
|---|---|---|---|---|---|---|---|
| ae15opi1 | 3.749 | | | | | | |
| ae14ope1 | 2.759 | 3.759 | | | | | |
| ae13opa1 | 2.595 | 2.708 | 3.248 | | | | |
| ae9opbe1 | 2.716 | 2.906 | 2.684 | 3.795 | | | |
| ae8opco1 | 2.450 | 2.637 | 2.449 | 2.595 | 3.344 | | |
| ae5oppe1 | 2.530 | 2.764 | 2.586 | 2.635 | 2.491 | 3.627 | |
| ae4opfo1 | 2.556 | 2.675 | 2.553 | 2.619 | 2.437 | 2.682 | 4.049 |

Condition number = 26.443
Eigenvalues
19.393 1.481 1.160 1.024 .950 .830 .733
Determinant of sample covariance matrix = 19.724

**Sample Correlations (Default)**

| | ae15opi1 | ae14ope1 | ae13opa1 | ae9opbe1 | ae8opco1 | ae5oppe1 | ae4opfo1 |
|---|---|---|---|---|---|---|---|
| ae15opi1 | 1.000 | | | | | | |
| ae14ope1 | .735 | 1.000 | | | | | |
| ae13opa1 | .744 | .775 | 1.000 | | | | |
| ae9opbe1 | .720 | .769 | .764 | 1.000 | | | |

| | ae15opi1 | ae14ope1 | ae13opa1 | ae9opbe1 | ae8opco1 | ae5oppe1 | ae4opfo1 |
|---|---|---|---|---|---|---|---|
| ae8opco1 | .692 | .744 | .743 | .729 | 1.000 | | |
| ae5oppe1 | .686 | .749 | .753 | .710 | .715 | 1.000 | |
| ae4opfo1 | .656 | .686 | .704 | .668 | .662 | .700 | 1.000 |

Condition number = 24.332
Eigenvalues
5.319 .375 .316 .279 .269 .224 .219

**Exhibit 4.84: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Entrepreneurial Attitude at $T_1$ *(Non-Entrepreneurs)***

Exhibit 4.85 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for Entrepreneurial Attitude at $T_1$. As can be seen from the Regression Weights, all seven of the observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the Entrepreneurial Attitude factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.791 to 0.887. These represent the correlations between each item and the Entrepreneurial Attitude factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.626 to 0.787.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae4opfo1 | <--- | EAOR1 | 1.592 | .165 | 9.621 | *** | par_1 |
| ae5oppe1 | <--- | EAOR1 | 1.611 | .151 | 10.659 | *** | par_2 |
| ae8opco1 | <--- | EAOR1 | 1.538 | .146 | 10.564 | *** | par_3 |
| ae9opbe1 | <--- | EAOR1 | 1.676 | .153 | 10.951 | *** | par_4 |
| ae13opa1 | <--- | EAOR1 | 1.599 | .139 | 11.518 | *** | par_5 |
| ae14ope1 | <--- | EAOR1 | 1.710 | .150 | 11.407 | *** | par_6 |
| ae15opi1 | <--- | EAOR1 | 1.607 | .155 | 10.342 | *** | par_7 |

**Standardized Regression Weights: (Default - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae4opfo1 | <--- | EAOR1 | .791 |
| ae5oppe1 | <--- | EAOR1 | .846 |
| ae8opco1 | <--- | EAOR1 | .841 |
| ae9opbe1 | <--- | EAOR1 | .860 |
| ae13opa1 | <--- | EAOR1 | .887 |
| ae14ope1 | <--- | EAOR1 | .882 |
| ae15opi1 | <--- | EAOR1 | .830 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| ae15opi1 | .689 |
| ae14ope1 | .778 |
| ae13opa1 | .787 |
| ae9opbe1 | .740 |
| ae8opco1 | .707 |
| ae5oppe1 | .715 |
| ae4opfo1 | .626 |

**Exhibit 4.85: Scalars for Entrepreneurial Attitude at $T_1$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 4.86 presents the Non-Entrepreneur Group Model Fit statistics for Entrepreneurial Attitude at $T_1$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the Entrepreneurial Attitude construct dimension at $T_1$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 2.625 with 2df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0089 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.028 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.86: Model Fit Statistics for Entrepreneurial Attitude at $T_1$**
**(*Non-Entrepreneurs*)**

### Entrepreneurial Attitude @ $T_2$ – *Non-Entrepreneur Group*

Exhibit 4.87 provides an overview of the one factor congeneric model for the construct, Entrepreneurial Attitude at $T_2$ for the Non-Entrepreneur Group. There are seven indicator items for the construct whose variable names are ae4opfo2, ae5oppe2, ae8opco2, ae9opbe2, ae13oppa2, ae14oppe2, and ae15oppi2. Thus, the latent variable, Entrepreneurial Attitude (measured at $T_2$), is a function of these observed variables at $T_2$.

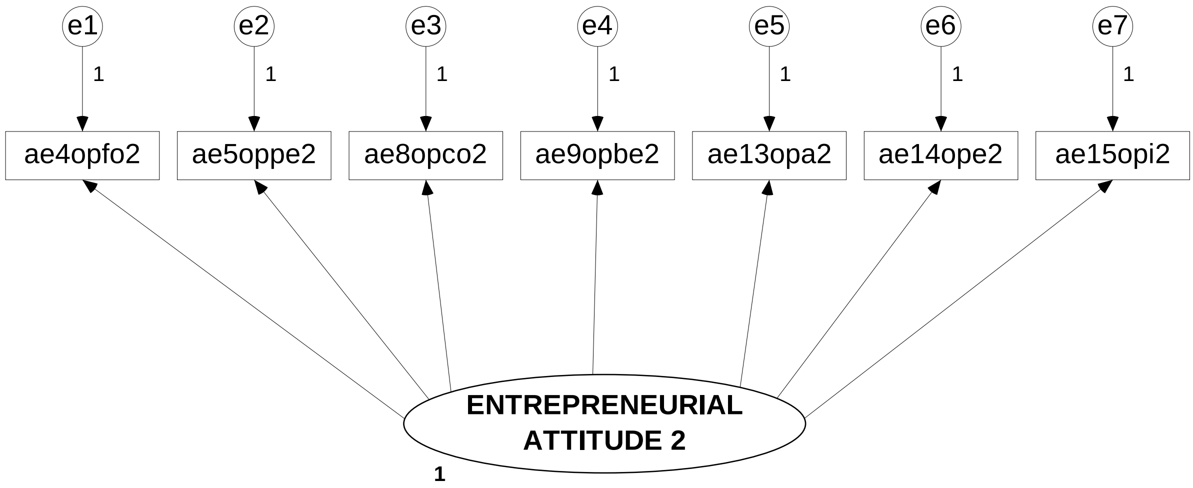



**Exhibit 4.87: One Factor Congeneric Model for Entrepreneurial Attitude at $T_2$**
***(Non-Entrepreneurs)***

Exhibit 4.88 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for Entrepreneurial Attitude at $T_2$. The sample correlations ranged from a low of 0.409 to a high of 0.557. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | ae15opi2 | ae14ope2 | ae13opa2 | ae9opbe2 | ae8opco2 | ae5oppe2 | ae4opfo2 |
|---|---|---|---|---|---|---|---|
| ae15opi2 | 3.802 | | | | | | |
| ae14ope2 | 2.081 | 4.079 | | | | | |
| ae13opa2 | 1.462 | 1.743 | 2.664 | | | | |
| ae9opbe2 | 1.692 | 2.009 | 1.449 | 3.194 | | | |
| ae8opco2 | 1.493 | 1.723 | 1.339 | 1.489 | 3.461 | | |
| ae5oppe2 | 1.733 | 2.037 | 1.491 | 1.653 | 1.543 | 3.966 | |
| ae4opfo2 | 1.441 | 1.620 | 1.205 | 1.396 | 1.283 | 1.453 | 2.841 |

Condition number = 9.198
Eigenvalues 13.117 2.180 2.149 1.877 1.708 1.550 1.426
Determinant of sample covariance matrix = 435.519

**Sample Correlations (Default)**

| | ae15opi2 | ae14ope2 | ae13opa2 | ae9opbe2 | ae8opco2 | ae5oppe2 | ae4opfo2 |
|---|---|---|---|---|---|---|---|
| ae15opi2 | 1.000 | | | | | | |
| ae14ope2 | .529 | 1.000 | | | | | |
| ae13opa2 | .459 | .529 | 1.000 | | | | |
| ae9opbe2 | .486 | .557 | .497 | 1.000 | | | |
| ae8opco2 | .412 | .458 | .441 | .448 | 1.000 | | |
| ae5oppe2 | .446 | .506 | .459 | .464 | .417 | 1.000 | |
| ae4opfo2 | .439 | .476 | .438 | .464 | .409 | .433 | 1.000 |

Condition number = 8.890
Eigenvalues 3.797 .606 .579 .558 .535 .498 .427

**Exhibit 4.88: Sample Covariances, Sample Correlations, & Eigenvalues**
**for the One-Factor Congeneric Model for Entrepreneurial Attitude at $T_2$**
***(Non-Entrepreneurs)***

Exhibit 4.89 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for Entrepreneurial Attitude at $T_2$. As can be seen from the Regression Weights, all seven of the observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the Entrepreneurial Attitude factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.620 to 0.763. These represent the correlations between each item and the Entrepreneurial Attitude factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.385 to 0.582.

**Regression Weights (Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae4opfo2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | 1.080 | .157 | 6.897 | *** | par_1 |
| ae8opco2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | 1.154 | .174 | 6.617 | *** | par_2 |
| ae9opbe2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | 1.286 | .160 | 8.025 | *** | par_3 |
| ae13opa2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | 1.128 | .148 | 7.601 | *** | par_4 |
| ae15opi2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | 1.321 | .178 | 7.407 | *** | par_5 |
| ae5oppe2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | 1.318 | .183 | 7.184 | *** | par_6 |
| ae14ope2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | 1.541 | .177 | 8.699 | *** | par_7 |

**Standardized Regression Weights (Default)**

| | | | Estimate |
|---|---|---|---|
| ae4opfo2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | .641 |
| ae8opco2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | .620 |
| ae9opbe2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | .720 |
| ae13opa2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | .691 |
| ae15opi2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | .678 |
| ae5oppe2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | .662 |
| ae14ope2 | <--- | ENTREPRENEURIAL_ATTITUDE 2 | .763 |

**Squared Multiple Correlations (Default)**

| | Estimate |
|---|---|
| ae15opi2 | .459 |
| ae14ope2 | .582 |
| ae13opa2 | .477 |
| ae9opbe2 | .518 |
| ae8opco2 | .385 |
| ae5oppe2 | .438 |
| ae4opfo2 | .411 |

**Exhibit 4.89: Scalars for Entrepreneurial Attitude at $T_2$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 4.90 presents the Non-Entrepreneur Group Model Fit statistics for Entrepreneurial Attitude at $T_2$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the Entrepreneurial Attitude construct dimension at $T_2$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 0.505with 14df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0069 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.085 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.90: Model Fit Statistics for Entrepreneurial Attitude at $T_2$**
**(*Non-Entrepreneurs*)**

### Entrepreneurial Attitude @ $T_3$ – *Non-Entrepreneur Group*

Exhibit 4.91 provides an overview of the one factor congeneric model for the construct, Entrepreneurial Attitude at $T_2$ for the Non-Entrepreneur Group. There are seven indicator items for the construct whose variable names are ae4opfo3, ae5oppe3, ae8opco3, ae9opbe3, ae13oppa3, ae14oppe3, and ae15oppi3. Thus, the latent variable, Entrepreneurial Attitude (measured at $T_3$), is a function of these observed variables at $T_3$.

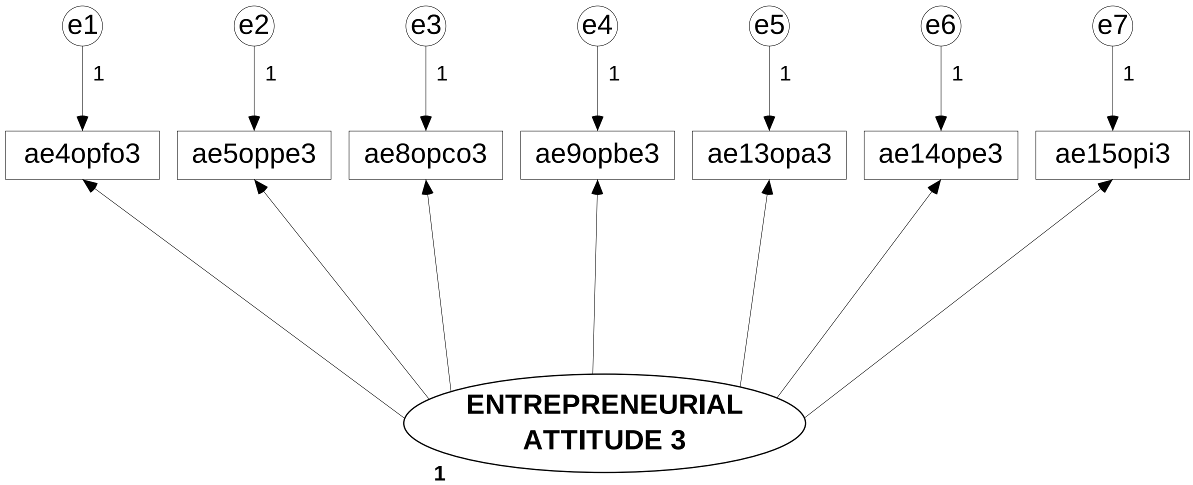



**Exhibit 4.91: One Factor Congeneric Model for Entrepreneurial Attitude at $T_3$**
***(Non-Entrepreneurs)***

Exhibit 4.92 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for Entrepreneurial Attitude at $T_3$. The sample correlations ranged from a low of 0.474 to a high of 0.577. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 |
|---|---|---|---|---|---|---|---|
| ae15opi3 | 3.863 | | | | | | |
| ae14ope3 | 1.987 | 3.412 | | | | | |
| ae13opa3 | 1.763 | 1.708 | 3.568 | | | | |
| ae9opbe3 | 2.029 | 1.767 | 1.787 | 3.449 | | | |
| ae8opco3 | 2.125 | 1.902 | 1.883 | 1.960 | 4.198 | | |
| ae5oppe3 | 1.845 | 1.654 | 1.705 | 1.814 | 1.876 | 3.566 | |
| ae4opfo3 | 2.197 | 1.879 | 1.761 | 2.039 | 2.165 | 1.935 | 3.752 |

Condition number = 9.902
Eigenvalues 15.095 2.046 2.011 1.892 1.669 1.569 1.525
Determinant of sample covariance matrix = 469.263

**Sample Correlations (Default)**

| | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 |
|---|---|---|---|---|---|---|---|
| ae15opi3 | 1.000 | | | | | | |
| ae14ope3 | .547 | 1.000 | | | | | |
| ae13opa3 | .475 | .490 | 1.000 | | | | |
| ae9opbe3 | .556 | .515 | .509 | 1.000 | | | |
| ae8opco3 | .528 | .503 | .487 | .515 | 1.000 | | |
| ae5oppe3 | .497 | .474 | .478 | .517 | .485 | 1.000 | |
| ae4opfo3 | .577 | .525 | .481 | .567 | .546 | .529 | 1.000 |

Condition number = 9.877
Eigenvalues 4.089 .557 .536 .499 .477 .429 .414

**Exhibit 4.92: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Entrepreneurial Attitude at $T_2$**
***(Non-Entrepreneurs)***

Exhibit 4.93 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for Entrepreneurial Attitude at $T_3$. As can be seen from the Regression Weights, all seven of the observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the Entrepreneurial Attitude factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.669 to 0.758. These represent the correlations between each item and the Entrepreneurial Attitude factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.447 to 0.575.

**Regression Weights (Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae4opfo3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | 1.468 | .168 | 8.738 | *** | par_1 |
| ae8opco3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | 1.455 | .182 | 7.982 | *** | par_2 |
| ae9opbe3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | 1.380 | .162 | 8.496 | *** | par_3 |
| ae13opa3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | 1.263 | .171 | 7.369 | *** | par_4 |
| ae15opi3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | 1.466 | .172 | 8.540 | *** | par_5 |
| ae5oppe3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | 1.298 | .170 | 7.639 | *** | par_6 |
| ae14ope3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | 1.307 | .164 | 7.945 | *** | par_7 |

**Standardized Regression Weights (Default)**

| | | | Estimate |
|---|---|---|---|
| ae4opfo3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | .758 |
| ae8opco3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | .710 |
| ae9opbe3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | .743 |
| ae13opa3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | .669 |
| ae15opi3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | .746 |
| ae5oppe3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | .687 |
| ae14ope3 | <--- | ENTREPRENEURIAL_ATTITUDE 3 | .708 |

**Squared Multiple Correlations (Default)**

| | Estimate |
|---|---|
| ae15opi3 | .556 |
| ae14ope3 | .501 |
| ae13opa3 | .447 |
| ae9opbe3 | .552 |
| ae8opco3 | .504 |
| ae5oppe3 | .472 |
| ae4opfo3 | .575 |

**Exhibit 4.93: Scalars for Entrepreneurial Attitude at $T_3$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 4.94 presents the Non-Entrepreneur Group Model Fit statistics for Entrepreneurial Attitude at $T_3$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the Entrepreneurial Attitude construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 1.588 with 14 df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0114 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.064 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.94: Model Fit Statistics for Entrepreneurial Attitude at $T_3$**
**(*Non-Entrepreneurs*)**

## 3.3 Confirmatory Factor Analysis of Combined Measurement Model

This section presents the results of the confirmatory factor analyses (CFA) of the combined measurement models. A measurement model describes, *a priori*, the relations between the indicator items and the underlying factors (latent variables). In this section, the CFA focuses on the association among all the latent variables and their factors. This step is undertaken to ensure that there are no cross-loadings. The results of the CFA provide the factor loadings of indicator items on related factors, factor correlations, model fit statistics, and results of the discriminant analyses. High factor loadings on items suggest convergent validity.

### 3.3.1 CFAs of Combined Measurement Model - *Nascent Entrepreneur Group*

This section presents the results of the analyses for the Nascent Entrepreneur Group combined measurement models for the Values construct at $T_1$ and Entrepreneurial Attitude at $T_1$, $T_2$, and $T_3$.

#### 3.3.1.1 Combined Measurement Model Analysis - *Nascent Entrepreneur Group* @ $T_1$

Exhibit 4.95 presents the confirmatory factor analysis model at $T_1$ for the Nascent Entrepreneur Group.

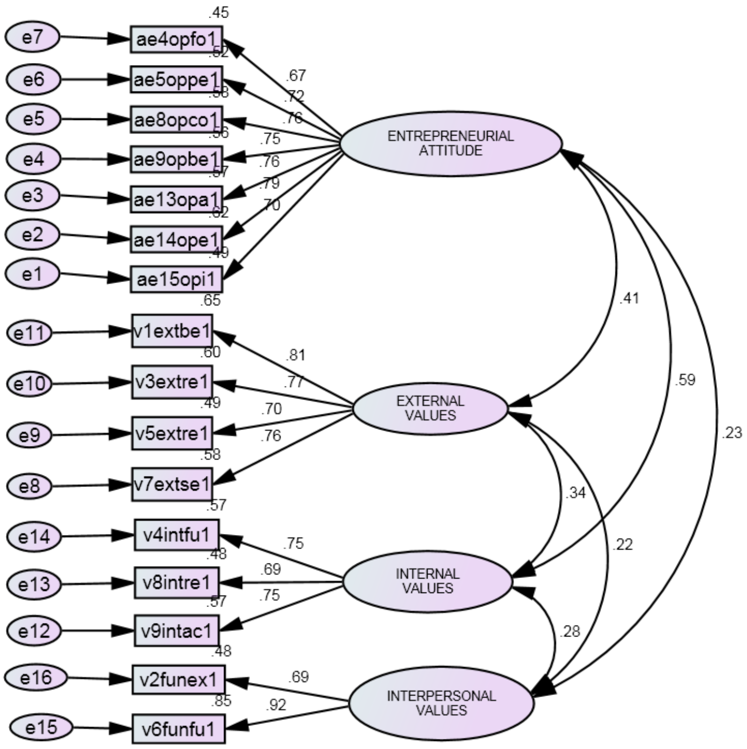



**Exhibit 4.95: CFA Combined Measurement Model at $T_1$**
**(*Nascent Entrepreneurs*)**

Exhibit 4.96 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items) for Entrepreneurial Attitude, External Values, Internal Values , and Interpersonal Values at $T_1$. As can be seen from the Regression Weights, the observed variables (factor coefficients) are statistically significant and therefore the indicator items significantly contribute toward the variance of the factors; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.672 to 0.920. These represent the correlations between each item and its respective factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.452 to 0.846.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae15opi1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.000 | | | | |
| ae14ope1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.124 | .092 | 12.280 | *** | par_1 |
| ae13opa1 | <--- | ENTREPRENEURIAL_ATTITUDE | .960 | .081 | 11.829 | *** | par_2 |
| ae9opbe1 | <--- | ENTREPRENEURIAL_ATTITUDE | .975 | .084 | 11.674 | *** | par_3 |

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae8opco1 | <--- | ENTREPRENEURIAL_ATTITUDE | .972 | .082 | 11.857 | *** | par_4 |
| ae5oppe1 | <--- | ENTREPRENEURIAL_ATTITUDE | .931 | .082 | 11.297 | *** | par_5 |
| ae4opfo1 | <--- | ENTREPRENEURIAL_ATTITUDE | .852 | .081 | 10.580 | *** | par_6 |
| v3extre1 | <--- | EXTERNAL_VALUES | .924 | .071 | 13.029 | *** | par_7 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.000 | | | | |
| v9intac1 | <--- | INTERNAL_VALUES | 1.049 | .100 | 10.492 | *** | par_8 |
| v8intre1 | <--- | INTERNAL_VALUES | .894 | .090 | 9.964 | *** | par_9 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.000 | | | | |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.340 | .306 | 4.375 | *** | par_10 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.000 | | | | |
| v5extre1 | <--- | EXTERNAL_VALUES | .797 | .068 | 11.778 | *** | par_11 |
| v7extse1 | <--- | EXTERNAL_VALUES | .874 | .068 | 12.797 | *** | par_12 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae15opi1 | <--- | ENTREPRENEURIAL_ATTITUDE | .702 |
| ae14ope1 | <--- | ENTREPRENEURIAL_ATTITUDE | .788 |
| ae13opa1 | <--- | ENTREPRENEURIAL_ATTITUDE | .756 |
| ae9opbe1 | <--- | ENTREPRENEURIAL_ATTITUDE | .746 |
| ae8opco1 | <--- | ENTREPRENEURIAL_ATTITUDE | .758 |
| ae5oppe1 | <--- | ENTREPRENEURIAL_ATTITUDE | .720 |
| ae4opfo1 | <--- | ENTREPRENEURIAL_ATTITUDE | .672 |
| v3extre1 | <--- | EXTERNAL_VALUES | .773 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .807 |
| v9intac1 | <--- | INTERNAL_VALUES | .754 |
| v8intre1 | <--- | INTERNAL_VALUES | .689 |
| v4intfu1 | <--- | INTERNAL_VALUES | .753 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .920 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .691 |
| v5extre1 | <--- | EXTERNAL_VALUES | .702 |
| v7extse1 | <--- | EXTERNAL_VALUES | .759 |

**Squared Multiple Correlations: (Group number 1 - Default model)**

| | Estimate |
|---|---|
| v2funex1 | .477 |
| v6funfu1 | .846 |
| v4intfu1 | .567 |
| v8intre1 | .475 |
| v9intac1 | .568 |
| v1extbe1 | .651 |
| v3extre1 | .597 |
| v5extre1 | .492 |
| v7extse1 | .576 |
| ae4opfo1 | .452 |
| ae5oppe1 | .519 |
| ae8opco1 | .575 |
| ae9opbe1 | .556 |
| ae13opa1 | .572 |
| ae14ope1 | .620 |
| ae15opi1 | .492 |

**Exhibit 4.96: Scalars for the Combined Measurement Model at $T_1$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 4.97 presents the results of the CFA of the Combined Measurement Model (using Maximum Likelihood estimation on the covariance matrix) at $T_1$. Since all results are within the acceptable levels, there is a good fit of the data to the hypothesized four factor Combined Measurement Model at $T_1$ for the Nascent Entrepreneur Group.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2 = 79.190$ with 98 df and p = 0.918 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0302 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.012 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.97: Model Fit Statistics for the Combined Measurement Model at $T_1$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: In this section, the results of the discriminant analyses for the six factor inter-relationships are presented. Exhibit 4.98 presents the correlations between the respective factors.

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .218 |
| ENTREPRENEURIAL_ATTITUDE | <--> | EXTERNAL_VALUES | .415 |
| EXTERNAL_VALUES | <--> | INTERNAL_VALUES | .343 |
| INTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .277 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERPERSONAL_VALUES | .233 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERNAL_VALUES | .587 |

**Exhibit 4.98: Factor Correlations at $T_1$**
**(*Nascent Entrepreneurs*)**

Using the correlations generated for each of the respective inter-relationships, Exhibit 4.99 presents the discriminant analyses for the six factor relationships. To calculate the extent to which the factors are empirically distinguishable (that is, to determine their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). Inspection of the structure coefficients for each of the factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items (that is, the structure coefficients for each respective factor of interest is greater than the structure coefficients of the alternative factor being compared). Hence, it can be concluded that the each of the factors displays discriminant validity.

| Indicator Variables | Internal Values1 | | External Values1 | |
|---|---|---|---|---|
| | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre1 | 0* | 0.241 | 0.702 | **0.702** |
| v3extre1 | 0* | 0.265 | 0.773 | **0.773** |
| v1extbe1 | 0* | 0.277 | 0.807 | **0.807** |
| v8intre1 | 0.689 | **0.689** | 0* | 0.236 |
| v4intfu1 | 0.753 | **0.753** | 0* | 0.258 |
| v7extse1 | 0* | 0.260 | 0.759 | **0.759** |
| v9intac1 | 0.754 | **0.754** | 0* | 0.259 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | External Values1 | |
|---|---|---|---|---|
| | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre1 | 0* | 0.153 | 0.702 | **0.702** |
| v3extre1 | 0* | 0.169 | 0.773 | **0.773** |
| v1extbe1 | 0* | 0.176 | 0.807 | **0.807** |
| v6funfu1 | 0.920 | **0.920** | 0* | 0.201 |
| v2funex1 | 0.691 | **0.691** | 0* | 0.151 |
| v7extse1 | 0* | 0.165 | 0.759 | **0.759** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | Internal Values1 | |
|---|---|---|---|---|
| | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v4intfu1 | 0* | 0.209 | 0.753 | **0.753** |
| v8intre1 | 0* | 0.191 | 0.689 | **0.689** |
| v9intac1 | 0* | 0.209 | 0.754 | **0.754** |
| v6funfu1 | 0.920 | **0.920** | 0* | 0.255 |
| v2funex1 | 0.691 | **0.691** | 0* | 0.191 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude1 | | External Values1 | |
|---|---|---|---|---|
| | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v1extbe | 0* | 0.335 | 0.807 | **0.807** |
| v3extre1 | 0* | 0.321 | 0.773 | **0.773** |
| v5extre1 | 0* | 0.291 | 0.702 | **0.702** |
| v7extse1 | 0* | 0.315 | 0.759 | **0.759** |
| ae4opfo1 | 0.672 | **0.672** | 0* | 0.279 |
| ae5oppe1 | 0.720 | **0.720** | 0* | 0.299 |
| ae8opco1 | 0.758 | **0.758** | 0* | 0.315 |
| ae9opbe1 | 0.746 | **0.746** | 0* | 0.310 |
| ae13opa1 | 0.756 | **0.756** | 0* | 0.314 |
| ae14ope1 | 0.788 | **0.788** | 0* | 0.327 |
| ae15opi1 | 0.702 | **0.702** | 0* | 0.291 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude1 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.442 | 0.753 | **0.753** |
| v8intre1 | 0* | 0.404 | 0.689 | **0.689** |
| v9intac1 | 0* | 0.443 | 0.754 | **0.754** |
| ae4opfo1 | 0.672 | **0.672** | 0* | 0.394 |
| ae5oppe1 | 0.720 | **0.720** | 0* | 0.423 |
| ae8opco1 | 0.758 | **0.758** | 0* | 0.445 |
| ae9opbe1 | 0.746 | **0.746** | 0* | 0.438 |
| ae13opa1 | 0.756 | **0.756** | 0* | 0.444 |
| ae14ope1 | 0.788 | **0.788** | 0* | 0.463 |
| ae15opi1 | 0.702 | **0.702** | 0* | 0.412 |

| Indicator Variables | Entrepreneurial Attitude1 | | Interpersonal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v2funex1 | 0* | 0.161 | 0.691 | **0.691** |
| v6funfu1 | 0* | 0.214 | 0.920 | **0.920** |
| ae4opfo1 | 0.672 | **0.672** | 0* | 0.157 |
| ae5oppe1 | 0.720 | **0.720** | 0* | 0.168 |
| ae8opco1 | 0.758 | **0.758** | 0* | 0.177 |
| ae9opbe1 | 0.746 | **0.746** | 0* | 0.174 |
| ae13opa1 | 0.756 | **0.756** | 0* | 0.176 |
| ae14ope1 | 0.788 | **0.788** | 0* | 0.184 |
| ae15opi1 | 0.702 | **0.702** | 0* | 0.164 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.99: Factor Pattern & Structure Coefficients for the Six Factor Inter-Relationships @ $T_1$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

### 3.3.1.2 Combined Measurement Model Analysis - *Nascent Entrepreneur Group* @ $T_2$

Exhibit 4.100 presents the confirmatory factor analysis model at $T_2$ for the Nascent Entrepreneur Group.

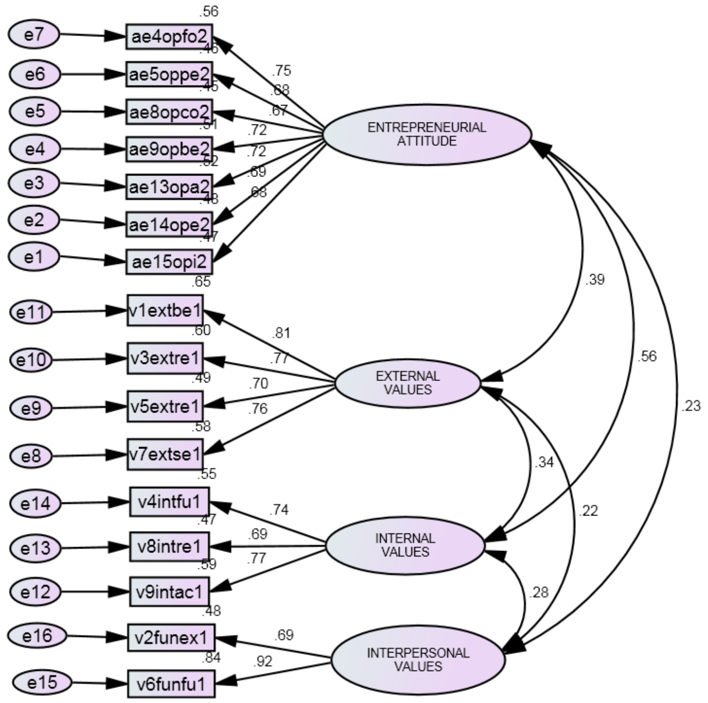



**Exhibit 4.100: CFA Combined Measurement Model at $T_2$**
**(*Nascent Entrepreneurs*)**

Exhibit 4.101 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items) for Entrepreneurial Attitude, External Values, Internal Values , and Interpersonal Values at $T_2$ (however, for simplicity, only the $T_1$ Values constructs were incorporated into the combined measurement model because there was no significant difference among the $T_1$, $T_2$, and $T_3$ variables). As can be seen from the Regression Weights, the observed variables (factor coefficients) are statistically significant and therefore the indicator items significantly contribute toward the variance of the factors; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.670 to 0.918. These represent the correlations between each item and its respective factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.449 to 0.843.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae15opi2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.189 | .095 | 12.506 | *** | par_1 |
| ae14ope2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.123 | .089 | 12.632 | *** | par_2 |
| ae13opa2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.224 | .091 | 13.431 | *** | par_3 |
| ae9opbe2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.120 | .084 | 13.305 | *** | par_4 |

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae8opco2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.147 | .094 | 12.175 | *** | par_5 |
| ae5oppe2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.091 | .088 | 12.376 | *** | par_6 |
| ae4opfo2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.086 | .077 | 14.162 | *** | par_7 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.320 | .091 | 14.463 | *** | par_8 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.429 | .093 | 15.330 | *** | par_9 |
| v9intac1 | <--- | INTERNAL_VALUES | 1.402 | .105 | 13.346 | *** | par_10 |
| v8intre1 | <--- | INTERNAL_VALUES | 1.175 | .100 | 11.800 | *** | par_11 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.296 | .101 | 12.864 | *** | par_12 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.523 | .183 | 8.336 | *** | par_13 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.141 | .151 | 7.551 | *** | par_14 |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.136 | .090 | 12.661 | *** | par_15 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.252 | .089 | 14.141 | *** | par_16 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae15opi2 | <--- | ENTREPRENEURIAL_ATTITUDE | .684 |
| ae14ope2 | <--- | ENTREPRENEURIAL_ATTITUDE | .689 |
| ae13opa2 | <--- | ENTREPRENEURIAL_ATTITUDE | .721 |
| ae9opbe2 | <--- | ENTREPRENEURIAL_ATTITUDE | .716 |
| ae8opco2 | <--- | ENTREPRENEURIAL_ATTITUDE | .670 |
| ae5oppe2 | <--- | ENTREPRENEURIAL_ATTITUDE | .679 |
| ae4opfo2 | <--- | ENTREPRENEURIAL_ATTITUDE | .749 |
| v3extre1 | <--- | EXTERNAL_VALUES | .773 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .807 |
| v9intac1 | <--- | INTERNAL_VALUES | .765 |
| v8intre1 | <--- | INTERNAL_VALUES | .689 |
| v4intfu1 | <--- | INTERNAL_VALUES | .742 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .918 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .692 |
| v5extre1 | <--- | EXTERNAL_VALUES | .700 |
| v7extse1 | <--- | EXTERNAL_VALUES | .760 |

**Squared Multiple Correlations: (Group number 1 - Default model)**

| | Estimate |
|---|---|
| v2funex1 | .479 |
| v6funfu1 | .843 |
| v4intfu1 | .550 |
| v8intre1 | .475 |
| v9intac1 | .586 |
| v1extbe1 | .651 |
| v3extre1 | .597 |
| v5extre1 | .490 |
| v7extse1 | .578 |
| ae4opfo2 | .562 |
| ae5oppe2 | .461 |
| ae8opco2 | .449 |
| ae9opbe2 | .513 |
| ae13opa2 | .520 |
| ae14ope2 | .475 |
| ae15opi2 | .468 |

**Exhibit 4.101: Scalars for the Combined Measurement Model at $T_2$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 4.102 presents the results of the CFA of the Combined Measurement Model (using Maximum Likelihood estimation on the covariance matrix) at $T_1$.

Since all results are within the acceptable levels, there is a good fit of the data to the hypothesized four factor Combined Measurement Model at $T_2$ for the Nascent Entrepreneur Group.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 56.894 with 98 df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0273 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.030 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.102: Model Fit Statistics for the Combined Measurement Model at $T_2$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: In this section, the results of the discriminant analyses for the six factor inter-relationships are presented. Exhibit 4.103 presents the correlations between the respective factors.

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .218 |
| ENTREPRENEURIAL_ATTITUDE | <--> | EXTERNAL_VALUES | .388 |
| EXTERNAL_VALUES | <--> | INTERNAL_VALUES | .342 |
| INTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .278 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERPERSONAL_VALUES | .228 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERNAL_VALUES | .559 |

**Exhibit 4.103: Factor Correlations at $T_2$**
**(*Nascent Entrepreneurs*)**

Using the correlations generated for each of the respective inter-relationships, Exhibit 4.104 presents the discriminant analyses for the six factor relationships (the discriminant analyses results for the External, Internal, and Interpersonal Values are reproduced here for completeness). To calculate the extent to which the factors are empirically distinguishable (that is, to determine their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). Inspection of the structure coefficients for each of the factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items (that is, the structure coefficients for each respective factor of interest is greater than the structure coefficients of the alternative factor being compared). Hence, it can be concluded that the each of the factors displays discriminant validity.

| | Internal Values1 | | External Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre1 | 0* | 0.239 | 0.700 | **0.700** |
| v3extre1 | 0* | 0.264 | 0.773 | **0.773** |
| v1extbe1 | 0* | 0.276 | 0.807 | **0.807** |
| v8intre1 | 0.689 | **0.689** | 0* | 0.236 |
| v4intfu1 | 0.742 | **0.742** | 0* | 0.254 |
| v7extse1 | 0* | 0.260 | 0.760 | **0.760** |
| v9intac1 | 0.765 | **0.765** | 0* | 0.262 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| | Interpersonal Values1 | | External Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre1 | 0* | 0.153 | 0.700 | **0.700** |
| v3extre1 | 0* | 0.169 | 0.773 | **0.773** |
| v1extbe1 | 0* | 0.176 | 0.807 | **0.807** |
| v6funfu1 | 0.918 | **0.918** | 0* | 0.200 |
| v2funex1 | 0.692 | **0.692** | 0* | 0.151 |
| v7extse1 | 0* | 0.166 | 0.760 | **0.760** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| | Interpersonal Values1 | | Internal Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v4intfu1 | 0* | 0.206 | 0.742 | **0.742** |
| v8intre1 | 0* | 0.192 | 0.689 | **0.689** |
| v9intac1 | 0* | 0.213 | 0.765 | **0.765** |
| v6funfu1 | 0.918 | **0.918** | 0* | 0.255 |
| v2funex1 | 0.692 | **0.692** | 0* | 0.192 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| | Entrepreneurial Attitude2 | | External Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v1extbe | 0* | 0.313 | 0.807 | **0.807** |
| v3extre1 | 0* | 0.300 | 0.773 | **0.773** |
| v5extre1 | 0* | 0.272 | 0.700 | **0.700** |
| v7extse1 | 0* | 0.295 | 0.760 | **0.760** |
| ae4opfo2 | 0.749 | **0.749** | 0* | 0.291 |
| ae5oppe2 | 0.679 | **0.679** | 0* | 0.263 |
| ae8opco2 | 0.670 | **0.670** | 0* | 0.260 |
| ae9opbe2 | 0.716 | **0.716** | 0* | 0.278 |
| ae13opa2 | 0.721 | **0.721** | 0* | 0.280 |
| ae14ope2 | 0.689 | **0.689** | 0* | 0.267 |
| ae15opi2 | 0.684 | **0.684** | 0* | 0.265 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude2 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.415 | 0.742 | **0.742** |
| v8intre1 | 0* | 0.385 | 0.689 | **0.689** |
| v9intac1 | 0* | 0.428 | 0.765 | **0.765** |
| ae4opfo2 | 0.749 | **0.749** | 0* | 0.419 |
| ae5oppe2 | 0.679 | **0.679** | 0* | 0.380 |
| ae8opco2 | 0.670 | **0.670** | 0* | 0.375 |
| ae9opbe2 | 0.716 | **0.716** | 0* | 0.400 |
| ae13opa2 | 0.721 | **0.721** | 0* | 0.403 |
| ae14ope2 | 0.689 | **0.689** | 0* | 0.385 |
| ae15opi2 | 0.684 | **0.684** | 0* | 0.382 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude2 | | Interpersonal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v2funex1 | 0* | 0.158 | 0.691 | **0.691** |
| v6funfu1 | 0* | 0.210 | 0.920 | **0.920** |
| ae4opfo2 | 0.749 | **0.749** | 0* | 0.171 |
| ae5oppe2 | 0.679 | **0.679** | 0* | 0.155 |
| ae8opco2 | 0.670 | **0.670** | 0* | 0.153 |
| ae9opbe2 | 0.716 | **0.716** | 0* | 0.163 |
| ae13opa2 | 0.721 | **0.721** | 0* | 0.164 |
| ae14ope2 | 0.689 | **0.689** | 0* | 0.157 |
| ae15opi2 | 0.684 | **0.684** | 0* | 0.156 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.104: Factor Pattern & Structure Coefficients for the Six Factor Inter-Relationships @ $T_2$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

### 3.3.1.3 Combined Measurement Model Analysis - *Nascent Entrepreneur Group* @ $T_3$

Exhibit 4.105 presents the confirmatory factor analysis model at $T_3$ for the Nascent Entrepreneur Group.

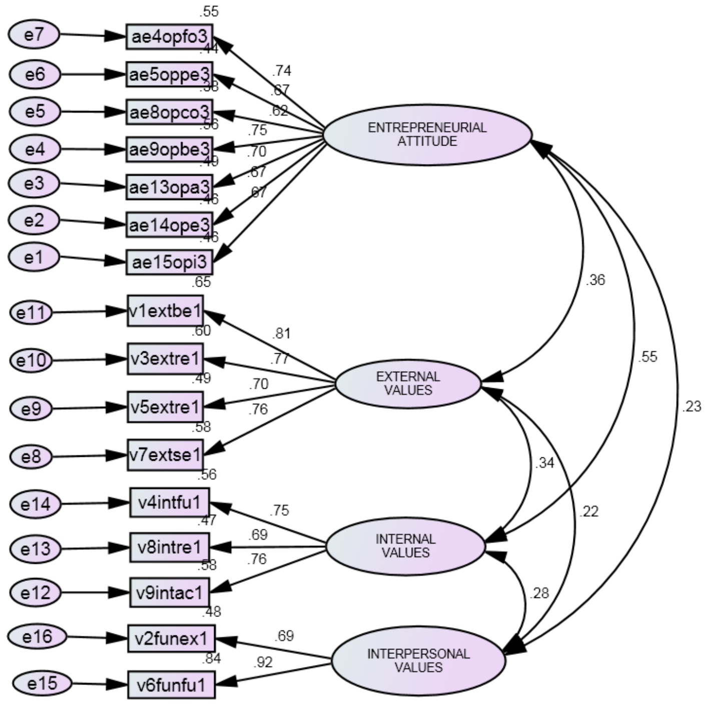



**Exhibit 4.105: CFA Combined Measurement Model at $T_3$**
**(*Nascent Entrepreneurs*)**

Exhibit 4.106 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items) for Entrepreneurial Attitude, External Values, Internal Values , and Interpersonal Values at $T_3$ (however, for simplicity, only the $T_1$ Values constructs were incorporated into the combined measurement model because there was no significant difference among the $T_1$, $T_2$, and $T_3$ variables). As can be seen from the Regression Weights, the observed variables (factor coefficients) are statistically significant and therefore the indicator items significantly contribute toward the variance of the factors; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.620 to 0.919. These represent the correlations between each item and its respective factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.384 to 0.845.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae15opi3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.116 | .091 | 12.242 | *** | par_1 |
| ae14ope3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.211 | .099 | 12.243 | *** | par_2 |
| ae13opa3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.125 | .087 | 12.867 | *** | par_3 |
| ae9opbe3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.138 | .081 | 14.119 | *** | par_4 |

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae8opco3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.090 | .099 | 10.982 | *** | par_5 |
| ae5oppe3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.064 | .088 | 12.053 | *** | par_6 |
| ae4opfo3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.072 | .077 | 13.838 | *** | par_7 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.319 | .091 | 14.433 | *** | par_8 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.430 | .093 | 15.336 | *** | par_9 |
| v9intac1 | <--- | INTERNAL_VALUES | 1.390 | .105 | 13.207 | *** | par_10 |
| v8intre1 | <--- | INTERNAL_VALUES | 1.172 | .100 | 11.760 | *** | par_11 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.310 | .101 | 13.021 | *** | par_12 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.524 | .182 | 8.395 | *** | par_13 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.140 | .150 | 7.589 | *** | par_14 |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.136 | .090 | 12.661 | *** | par_15 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.252 | .089 | 14.142 | *** | par_16 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae15opi3 | <--- | ENTREPRENEURIAL_ATTITUDE | .675 |
| ae14ope3 | <--- | ENTREPRENEURIAL_ATTITUDE | .675 |
| ae13opa3 | <--- | ENTREPRENEURIAL_ATTITUDE | .701 |
| ae9opbe3 | <--- | ENTREPRENEURIAL_ATTITUDE | .750 |
| ae8opco3 | <--- | ENTREPRENEURIAL_ATTITUDE | .620 |
| ae5oppe3 | <--- | ENTREPRENEURIAL_ATTITUDE | .667 |
| ae4opfo3 | <--- | ENTREPRENEURIAL_ATTITUDE | .739 |
| v3extre1 | <--- | EXTERNAL_VALUES | .772 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .807 |
| v9intac1 | <--- | INTERNAL_VALUES | .759 |
| v8intre1 | <--- | INTERNAL_VALUES | .687 |
| v4intfu1 | <--- | INTERNAL_VALUES | .750 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .919 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .691 |
| v5extre1 | <--- | EXTERNAL_VALUES | .700 |
| v7extse1 | <--- | EXTERNAL_VALUES | .760 |

**Squared Multiple Correlations: (Group number 1 - Default model)**

| | Estimate |
|---|---|
| v2funex1 | .478 |
| v6funfu1 | .845 |
| v4intfu1 | .562 |
| v8intre1 | .472 |
| v9intac1 | .576 |
| v1extbe1 | .651 |
| v3extre1 | .596 |
| v5extre1 | .490 |
| v7extse1 | .578 |
| ae4opfo3 | .546 |
| ae5oppe3 | .444 |
| ae8opco3 | .384 |
| ae9opbe3 | .562 |
| ae13opa3 | .491 |
| ae14ope3 | .455 |
| ae15opi3 | .455 |

**Exhibit 4.106: Scalars for the Combined Measurement Model at $T_3$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 4.107 presents the results of the CFA of the Combined Measurement Model (using Maximum Likelihood estimation on the covariance matrix) at $T_3$. Since all results are within the acceptable levels, there is a good fit of the data to the hypothesized four factor Combined Measurement Model at $T_2$ for the Nascent Entrepreneur Group.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 48.276 with 98 df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0254 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.038 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.107: Model Fit Statistics for the Combined Measurement Model at $T_3$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: In this section, the results of the discriminant analyses for the six factor inter-relationships are presented. Exhibit 4.108 presents the correlations between the respective factors.

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .218 |
| ENTREPRENEURIAL_ATTITUDE | <--> | EXTERNAL_VALUES | .388 |
| EXTERNAL_VALUES | <--> | INTERNAL_VALUES | .342 |
| INTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .278 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERPERSONAL_VALUES | .228 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERNAL_VALUES | .559 |

**Exhibit 4.108: Factor Correlations at $T_3$**
**(*Nascent Entrepreneurs*)**

Using the correlations generated for each of the respective inter-relationships, Exhibit 4.109 presents the discriminant analyses for the six factor relationships (the discriminant analyses results for the External, Internal, and Interpersonal Values are reproduced here for completeness). To calculate the extent to which the factors are empirically distinguishable (that is, to determine their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). Inspection of the structure coefficients for each of the factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items (that is, the structure coefficients for each respective factor of interest is greater than the structure coefficients of the alternative factor being compared). Hence, it can be concluded that the each of the factors displays discriminant validity.

| | Internal Values1 | | External Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre1 | 0* | 0.239 | 0.700 | **0.700** |
| v3extre1 | 0* | 0.264 | 0.772 | **0.772** |
| v1extbe1 | 0* | 0.276 | 0.807 | **0.807** |
| v8intre1 | 0.687 | **0.687** | 0* | 0.235 |
| v4intfu1 | 0.750 | **0.750** | 0* | 0.257 |
| v7extse1 | 0* | 0.260 | 0.760 | **0.760** |
| v9intac1 | 0.759 | **0.759** | 0* | 0.260 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| | Interpersonal Values1 | | External Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre1 | 0* | 0.153 | 0.700 | **0.700** |
| v3extre1 | 0* | 0.168 | 0.772 | **0.772** |
| v1extbe1 | 0* | 0.176 | 0.807 | **0.807** |
| v6funfu1 | 0.919 | **0.919** | 0* | 0.200 |
| v2funex1 | 0.691 | **0.691** | 0* | 0.151 |
| v7extse1 | 0* | 0.166 | 0.760 | **0.760** |

| | Interpersonal Values1 | | Internal Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v4intfu1 | 0* | 0.209 | 0.750 | **0.750** |
| v8intre1 | 0* | 0.191 | 0.687 | **0.687** |
| v9intac1 | 0* | 0.211 | 0.759 | **0.759** |
| v6funfu1 | 0.919 | **0.919** | 0* | 0.255 |
| v2funex1 | 0.691 | **0.691** | 0* | 0.192 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| | Entrepreneurial Attitude3 | | External Values1 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v1extbe | 0* | 0.313 | 0.807 | **0.807** |
| v3extre1 | 0* | 0.300 | 0.772 | **0.772** |
| v5extre1 | 0* | 0.272 | 0.700 | **0.700** |
| v7extse1 | 0* | 0.295 | 0.760 | **0.760** |
| ae4opfo3 | 0.739 | **0.739** | 0* | 0.287 |
| ae5oppe3 | 0.667 | **0.667** | 0* | 0.259 |
| ae8opco3 | 0.620 | **0.620** | 0* | 0.241 |
| ae9opbe3 | 0.750 | **0.750** | 0* | 0.291 |
| ae13opa3 | 0.701 | **0.701** | 0* | 0.272 |
| ae14ope3 | 0.675 | **0.675** | 0* | 0.262 |
| ae15opi3 | 0.675 | **0.675** | 0* | 0.262 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude3 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.419 | 0.750 | **0.750** |
| v8intre1 | 0* | 0.384 | 0.687 | **0.687** |
| v9intac1 | 0* | 0.424 | 0.759 | **0.759** |
| ae4opfo3 | 0.739 | **0.739** | 0* | 0.413 |
| ae5oppe3 | 0.667 | **0.667** | 0* | 0.373 |
| ae8opco3 | 0.620 | **0.620** | 0* | 0.347 |
| ae9opbe3 | 0.750 | **0.750** | 0* | 0.419 |
| ae13opa3 | 0.701 | **0.701** | 0* | 0.392 |
| ae14ope3 | 0.675 | **0.675** | 0* | 0.377 |
| ae15opi3 | 0.675 | **0.675** | 0* | 0.377 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude3 | | Interpersonal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v2funex1 | 0* | 0.158 | 0.691 | **0.691** |
| v6funfu1 | 0* | 0.210 | 0.919 | **0.919** |
| ae4opfo3 | 0.739 | **0.739** | 0* | 0.168 |
| ae5oppe3 | 0.667 | **0.667** | 0* | 0.152 |
| ae8opco3 | 0.620 | **0.620** | 0* | 0.141 |
| ae9opbe3 | 0.750 | **0.750** | 0* | 0.171 |
| ae13opa3 | 0.701 | **0.701** | 0* | 0.160 |
| ae14ope3 | 0.675 | **0.675** | 0* | 0.154 |
| ae15opi3 | 0.675 | **0.675** | 0* | 0.154 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.109: Factor Pattern & Structure Coefficients for the Six Factor Inter-Relationships @ $T_3$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

### 3.3.2 CFAs of Combined Measurement Model - *Non-Entrepreneur Group*

This section presents the results of the analyses for the Non-Entrepreneur Group combined measurement models for the Values construct at $T_1$ and Entrepreneurial Attitude at $T_1$, $T_2$, and $T_3$.

#### 3.3.2.1 Combined Measurement Model Analysis – *Non- Entrepreneur Group* @ $T_1$

Exhibit 4.110 presents the confirmatory factor analysis model at $T_1$ for the Non-Entrepreneur Group.

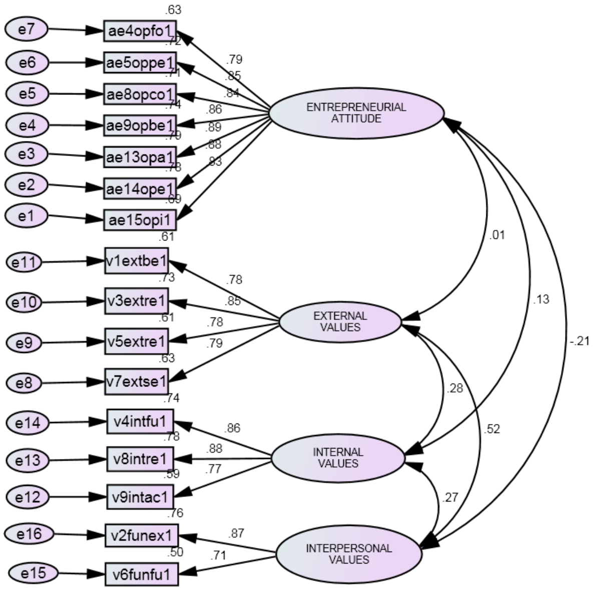



**Exhibit 4.110: CFA Combined Measurement Model at $T_1$**
**(*Non-Entrepreneurs*)**

Exhibit 4.111 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items) for Entrepreneurial Attitude, External Values, Internal Values , and Interpersonal Values at $T_1$. As can be seen from the Regression Weights, the observed variables (factor coefficients) are statistically significant and therefore the indicator items significantly contribute toward the variance of the factors; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.709 to 0.887. These represent the correlations between each item and its respective factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.503 to 0.786.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae15opi1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.606 | .155 | 10.336 | *** | par_1 |
| ae14ope1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.709 | .150 | 11.393 | *** | par_2 |
| ae13opa1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.598 | .139 | 11.513 | *** | par_3 |
| ae9opbe1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.677 | .153 | 10.958 | *** | par_4 |
| ae8opco1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.538 | .146 | 10.568 | *** | par_5 |
| ae5oppe1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.612 | .151 | 10.670 | *** | par_6 |
| ae4opfo1 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.593 | .165 | 9.632 | *** | par_7 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.522 | .147 | 10.368 | *** | par_8 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.386 | .153 | 9.082 | *** | par_9 |

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v9intac1 | <--- | INTERNAL_VALUES | 1.494 | .167 | 8.960 | *** | par_10 |
| v8intre1 | <--- | INTERNAL_VALUES | 1.718 | .159 | 10.817 | *** | par_11 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.602 | .154 | 10.421 | *** | par_12 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.281 | .190 | 6.741 | *** | par_13 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.594 | .199 | 7.993 | *** | par_14 |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.591 | .174 | 9.141 | *** | par_15 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.334 | .143 | 9.324 | *** | par_16 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae15opi1 | <--- | ENTREPRENEURIAL_ATTITUDE | .829 |
| ae14ope1 | <--- | ENTREPRENEURIAL_ATTITUDE | .881 |
| ae13opa1 | <--- | ENTREPRENEURIAL_ATTITUDE | .887 |
| ae9opbe1 | <--- | ENTREPRENEURIAL_ATTITUDE | .861 |
| ae8opco1 | <--- | ENTREPRENEURIAL_ATTITUDE | .841 |
| ae5oppe1 | <--- | ENTREPRENEURIAL_ATTITUDE | .846 |
| ae4opfo1 | <--- | ENTREPRENEURIAL_ATTITUDE | .792 |
| v3extre1 | <--- | EXTERNAL_VALUES | .852 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .779 |
| v9intac1 | <--- | INTERNAL_VALUES | .771 |
| v8intre1 | <--- | INTERNAL_VALUES | .885 |
| v4intfu1 | <--- | INTERNAL_VALUES | .862 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .709 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .870 |
| v5extre1 | <--- | EXTERNAL_VALUES | .782 |
| v7extse1 | <--- | EXTERNAL_VALUES | .793 |

**Squared Multiple Correlations: (Group number 1 - Default model)**

| | Estimate |
|---|---|
| v2funex1 | .758 |
| v6funfu1 | .503 |
| v4intfu1 | .743 |
| v8intre1 | .783 |
| v9intac1 | .595 |
| v1extbe1 | .606 |
| v3extre1 | .727 |
| v5extre1 | .612 |
| v7extse1 | .629 |
| ae4opfo1 | .627 |
| ae5oppe1 | .716 |
| ae8opco1 | .708 |
| ae9opbe1 | .741 |
| ae13opa1 | .786 |
| ae14ope1 | .777 |
| ae15opi1 | .688 |

**Exhibit 4.111: Scalars for the Combined Measurement Model at $T_1$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 4.112 presents the results of the CFA of the Combined Measurement Model (using Maximum Likelihood estimation on the covariance matrix) at $T_1$. Since all results are within the acceptable levels, there is a good fit of the data to the hypothesized four factor Combined Measurement Model at $T_1$ for the Non-Entrepreneur Group.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 22.287 with 98 df and p = 0.918 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0326 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.092 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.112: Model Fit Statistics for the Combined Measurement Model at $T_1$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: In this section, the results of the discriminant analyses for the six factor inter-relationships are presented. Exhibit 4.113 presents the correlations between the respective factors.

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .516 |
| ENTREPRENEURIAL_ATTITUDE | <--> | EXTERNAL_VALUES | .011 |
| EXTERNAL_VALUES | <--> | INTERNAL_VALUES | .285 |
| INTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .268 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERPERSONAL_VALUES | -.211 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERNAL_VALUES | .135 |

**Exhibit 4.113: Factor Correlations at $T_1$**
**(*Non-Entrepreneurs*)**

Using the correlations generated for each of the respective inter-relationships, Exhibit 4.114 presents the discriminant analyses for the six factor relationships. To calculate the extent to which the factors are empirically distinguishable (that is, to determine their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). Inspection of the structure coefficients for each of the factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items (that is, the structure coefficients for each respective factor of interest is greater than the structure coefficients of the alternative factor being compared). Hence, it can be concluded that the each of the factors displays discriminant validity.

| Indicator Variables | Internal Values1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre1 | 0* | 0.223 | 0.782 | **0.782** |
| v3extre1 | 0* | 0.243 | 0.852 | **0.852** |
| v1extbe1 | 0* | 0.222 | 0.779 | **0.779** |
| v8intre1 | 0.885 | **0.885** | 0* | 0.252 |
| v4intfu1 | 0.862 | **0.862** | 0* | 0.246 |
| v7extse1 | 0* | 0.226 | 0.793 | **0.793** |
| v9intac1 | 0.771 | **0.771** | 0* | 0.220 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre1 | 0* | 0.404 | 0.782 | **0.782** |
| v3extre1 | 0* | 0.440 | 0.852 | **0.852** |
| v1extbe1 | 0* | 0.402 | 0.779 | **0.779** |
| v6funfu1 | 0.709 | **0.709** | 0* | 0.366 |
| v2funex1 | 0.870 | **0.870** | 0* | 0.449 |
| v7extse1 | 0* | 0.409 | 0.793 | **0.793** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.231 | 0.862 | **0.862** |
| v8intre1 | 0* | 0.237 | 0.885 | **0.885** |
| v9intac1 | 0* | 0.207 | 0.771 | **0.771** |
| v6funfu2 | 0.709 | **0.709** | 0* | 0.190 |
| v2funex2 | 0.870 | **0.870** | 0* | 0.233 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v1extbe | 0* | 0.009 | 0.779 | **0.779** |
| v3extre1 | 0* | 0.009 | 0.852 | **0.852** |
| v5extre1 | 0* | 0.009 | 0.782 | **0.782** |
| v7extse1 | 0* | 0.009 | 0.793 | **0.793** |
| ae4opfo1 | 0.792 | **0.792** | 0* | 0.009 |
| ae5oppe1 | 0.846 | **0.846** | 0* | 0.009 |
| ae8opco1 | 0.841 | **0.841** | 0* | 0.009 |
| ae9opbe1 | 0.861 | **0.861** | 0* | 0.009 |
| ae13opa1 | 0.887 | **0.887** | 0* | 0.010 |
| ae14ope1 | 0.881 | **0.881** | 0* | 0.010 |
| ae15opi1 | 0.829 | **0.829** | 0* | 0.009 |

| Indicator Variables | Entrepreneurial Attitude1 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.116 | 0.862 | **0.862** |
| v8intre1 | 0* | 0.119 | 0.885 | **0.885** |
| v9intac1 | 0* | 0.104 | 0.771 | **0.771** |
| ae4opfo1 | 0.792 | **0.792** | 0* | 0.107 |
| ae5oppe1 | 0.846 | **0.846** | 0* | 0.114 |
| ae8opco1 | 0.841 | **0.841** | 0* | 0.114 |
| ae9opbe1 | 0.861 | **0.861** | 0* | 0.116 |
| ae13opa1 | 0.887 | **0.887** | 0* | 0.120 |
| ae14ope1 | 0.881 | **0.881** | 0* | 0.119 |
| ae15opi1 | 0.829 | **0.829** | 0* | 0.112 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude1 | | Interpersonal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v2funex1 | 0* | 0.184 | 0.87 | **0.870** |
| v6funfu1 | 0* | 0.150 | 0.709 | **0.709** |
| ae4opfo1 | 0.792 | **0.792** | 0* | 0.167 |
| ae5oppe1 | 0.846 | **0.846** | 0* | 0.179 |
| ae8opco1 | 0.841 | **0.841** | 0* | 0.177 |
| ae9opbe1 | 0.861 | **0.861** | 0* | 0.182 |
| ae13opa1 | 0.887 | **0.887** | 0* | 0.187 |
| ae14ope1 | 0.881 | **0.881** | 0* | 0.186 |
| ae15opi1 | 0.829 | **0.829** | 0* | 0.175 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.114: Factor Pattern & Structure Coefficients for the Six Factor Inter-Relationships @ $T_1$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

### 3.3.2.2 Combined Measurement Model Analysis - *Non- Entrepreneur Group* @ $T_2$

Exhibit 4.115 presents the confirmatory factor analysis model at $T_2$ for the Non-Entrepreneur Group. Exhibit 4.116 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items) for Entrepreneurial Attitude, External Values, Internal Values , and Interpersonal Values at $T_2$ (however, for simplicity, only the $T_1$ Values constructs were incorporated into the combined measurement model because there was no significant difference among the $T_1$, $T_2$, and $T_3$ variables). As can be seen from the Regression Weights, the observed variables (factor coefficients) are statistically significant and therefore the indicator items significantly contribute toward the variance of the factors; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.622 to 0.884. These represent the correlations between each item and its respective factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.387 to 0.782.

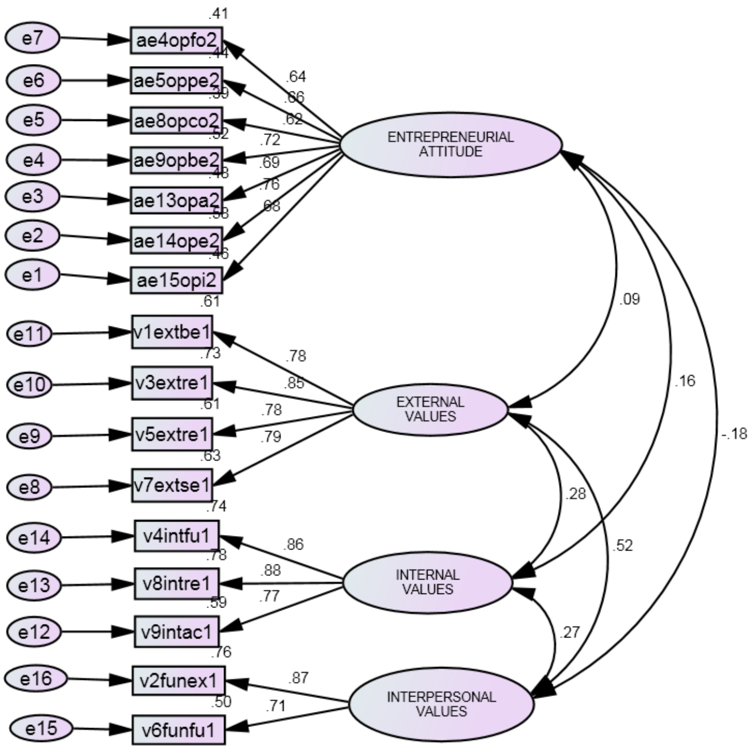



**Exhibit 4.115: CFA Combined Measurement Model at $T_2$**
**(*Non-Entrepreneurs*)**

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae15opi2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.316 | .178 | 7.380 | *** | par_1 |
| ae14ope2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.539 | .177 | 8.695 | *** | par_2 |
| ae13opa2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.126 | .148 | 7.593 | *** | par_3 |
| ae9opbe2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.288 | .160 | 8.046 | *** | par_4 |
| ae8opco2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.157 | .174 | 6.645 | *** | par_5 |
| ae5oppe2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.320 | .183 | 7.208 | *** | par_6 |
| ae4opfo2 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.083 | .156 | 6.927 | *** | par_7 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.522 | .147 | 10.380 | *** | par_8 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.386 | .153 | 9.080 | *** | par_9 |
| v9intac1 | <--- | INTERNAL_VALUES | 1.493 | .167 | 8.950 | *** | par_10 |
| v8intre1 | <--- | INTERNAL_VALUES | 1.717 | .159 | 10.806 | *** | par_11 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.604 | .154 | 10.439 | *** | par_12 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.279 | .190 | 6.722 | *** | par_13 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.596 | .200 | 7.981 | *** | par_14 |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.591 | .174 | 9.144 | *** | par_15 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.333 | .143 | 9.320 | *** | par_16 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae15opi2 | <--- | ENTREPRENEURIAL_ATTITUDE | .675 |
| ae14ope2 | <--- | ENTREPRENEURIAL_ATTITUDE | .762 |
| ae13opa2 | <--- | ENTREPRENEURIAL_ATTITUDE | .690 |
| ae9opbe2 | <--- | ENTREPRENEURIAL_ATTITUDE | .720 |
| ae8opco2 | <--- | ENTREPRENEURIAL_ATTITUDE | .622 |
| ae5oppe2 | <--- | ENTREPRENEURIAL_ATTITUDE | .663 |
| ae4opfo2 | <--- | ENTREPRENEURIAL_ATTITUDE | .643 |
| v3extre1 | <--- | EXTERNAL_VALUES | .853 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .778 |
| v9intac1 | <--- | INTERNAL_VALUES | .770 |
| v8intre1 | <--- | INTERNAL_VALUES | .884 |
| v4intfu1 | <--- | INTERNAL_VALUES | .863 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .708 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .871 |
| v5extre1 | <--- | EXTERNAL_VALUES | .782 |
| v7extse1 | <--- | EXTERNAL_VALUES | .793 |

**Squared Multiple Correlations: (Group number 1 - Default model)**

| | Estimate |
|---|---|
| v2funex1 | .759 |
| v6funfu1 | .502 |
| v4intfu1 | .745 |
| v8intre1 | .782 |
| v9intac1 | .594 |
| v1extbe1 | .606 |
| v3extre1 | .727 |
| v5extre1 | .612 |
| v7extse1 | .628 |
| ae4opfo2 | .413 |
| ae5oppe2 | .439 |
| ae8opco2 | .387 |
| ae9opbe2 | .519 |
| ae13opa2 | .476 |
| ae14ope2 | .581 |
| ae15opi2 | .456 |

**Exhibit 4.116: Scalars for the Combined Measurement Model at $T_2$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 4.117 presents the results of the CFA of the Combined Measurement Model (using Maximum Likelihood estimation on the covariance matrix) at $T_1$. Since all results are within the acceptable levels, there is a good fit of the data to the hypothesized four factor Combined Measurement Model at $T_2$ for the Non-Entrepreneur Group.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 18.493 with df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0279 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.155 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.117: Model Fit Statistics for the Combined Measurement Model at $T_2$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: In this section, the results of the discriminant analyses for the six factor inter-relationships are presented. Exhibit 4.118 presents the correlations between the respective factors.

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .515 |
| ENTREPRENEURIAL_ATTITUDE | <--> | EXTERNAL_VALUES | .091 |
| EXTERNAL_VALUES | <--> | INTERNAL_VALUES | .285 |
| INTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .267 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERPERSONAL_VALUES | -.180 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERNAL_VALUES | .157 |

**Exhibit 4.118: Factor Correlations at $T_2$**
**(*Non-Entrepreneurs*)**

Using the correlations generated for each of the respective inter-relationships, Exhibit 4.119 presents the discriminant analyses for the six factor relationships (the discriminant analyses results for the External, Internal, and Interpersonal Values are reproduced here for completeness). To calculate the extent to which the factors are empirically distinguishable (that is, to determine their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). Inspection of the structure coefficients for each of the factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items (that is, the structure coefficients for each respective factor of interest is greater than the structure coefficients of the alternative factor being compared). Hence, it can be concluded that the each of the factors displays discriminant validity.

| Indicator Variables | Internal Values1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre1 | 0* | 0.223 | 0.782 | **0.782** |
| v3extre1 | 0* | 0.243 | 0.853 | **0.853** |
| v1extbe1 | 0* | 0.222 | 0.778 | **0.778** |
| v8intre1 | 0.884 | **0.884** | 0* | 0.252 |
| v4intfu1 | 0.863 | **0.863** | 0* | 0.246 |
| v7extse1 | 0* | 0.226 | 0.793 | **0.793** |
| v9intac1 | 0.770 | **0.770** | 0* | 0.219 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre1 | 0* | 0.403 | 0.782 | **0.782** |
| v3extre1 | 0* | 0.439 | 0.853 | **0.853** |
| v1extbe1 | 0* | 0.401 | 0.778 | **0.778** |
| v6funfu1 | 0.708 | **0.708** | 0* | 0.365 |
| v2funex1 | 0.871 | **0.871** | 0* | 0.449 |
| v7extse1 | 0* | 0.408 | 0.793 | **0.793** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.230 | 0.863 | **0.863** |
| v8intre1 | 0* | 0.236 | 0.884 | **0.884** |
| v9intac1 | 0* | 0.206 | 0.770 | **0.770** |
| v6funfu2 | 0.708 | **0.708** | 0* | 0.189 |
| v2funex2 | 0.871 | **0.871** | 0* | 0.233 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude2 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v1extbe | 0* | 0.071 | **0.778** | **0.778** |
| v3extre1 | 0* | 0.078 | **0.853** | **0.853** |
| v5extre1 | 0* | 0.071 | 0.782 | **0.782** |
| v7extse1 | 0* | 0.072 | 0.793 | **0.793** |
| ae4opfo2 | 0.643 | **0.643** | 0* | 0.059 |
| ae5oppe2 | 0.663 | **0.663** | 0* | 0.060 |
| ae8opco2 | 0.622 | **0.622** | 0* | 0.057 |
| ae9opbe2 | 0.720 | **0.720** | 0* | 0.066 |
| ae13opa2 | 0.690 | **0.690** | 0* | 0.063 |
| ae14ope2 | 0.762 | **0.762** | 0* | 0.069 |
| ae15opi2 | 0.675 | **0.675** | 0* | 0.061 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude2 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.135 | 0.863 | **0.863** |
| v8intre1 | 0* | 0.139 | 0.884 | **0.884** |
| v9intac1 | 0* | 0.121 | 0.770 | **0.770** |
| ae4opfo2 | 0.643 | **0.643** | 0* | 0.101 |
| ae5oppe2 | 0.663 | **0.663** | 0* | 0.104 |
| ae8opco2 | 0.622 | **0.622** | 0* | 0.098 |
| ae9opbe2 | 0.720 | **0.720** | 0* | 0.113 |
| ae13opa2 | 0.690 | **0.690** | 0* | 0.108 |
| ae14ope2 | 0.762 | **0.762** | 0* | 0.120 |
| ae15opi2 | 0.675 | **0.675** | 0* | 0.106 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude2 | | Interpersonal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v2funex1 | 0* | -0.157 | 0.871 | **0.871** |
| v6funfu1 | 0* | -0.127 | 0.708 | **0.708** |
| ae4opfo2 | 0.643 | **0.643** | 0* | -0.116 |
| ae5oppe2 | 0.663 | **0.663** | 0* | -0.119 |
| ae8opco2 | 0.622 | **0.622** | 0* | -0.112 |
| ae9opbe2 | 0.720 | **0.720** | 0* | -0.130 |
| ae13opa2 | 0.690 | **0.690** | 0* | -0.124 |
| ae14ope2 | 0.762 | **0.762** | 0* | -0.137 |
| ae15opi2 | 0.675 | **0.675** | 0* | -0.122 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.119: Factor Pattern & Structure Coefficients for the Six Factor Inter-Relationships @ $T_2$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

### 3.3.2.3 Combined Measurement Model Analysis - *Non- Entrepreneur Group* @ $T_3$

Exhibit 4.120 presents the confirmatory factor analysis model at $T_3$ for the Non-Entrepreneur Group. Exhibit 4.121 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items) for Entrepreneurial Attitude, External Values, Internal Values , and Interpersonal Values at $T_3$ (however, for simplicity, only the $T_1$ Values constructs were incorporated into the combined measurement model because there was no significant difference among the $T_1$, $T_2$, and $T_3$ variables). As can be seen from the Regression Weights, the observed variables (factor coefficients) are statistically significant and therefore the indicator items significantly contribute toward the variance of the factors; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

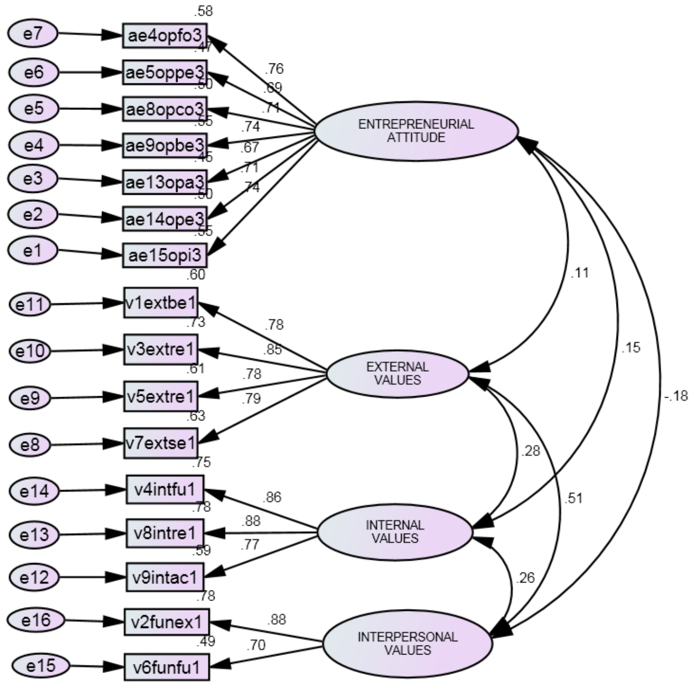



**Exhibit 4.120: CFA Combined Measurement Model at $T_3$**
**(*Non-Entrepreneurs*)**

The Non-Entrepreneur Group standardised regression weights range from 0.669 to 0.884. These represent the correlations between each item and its respective factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.447 to 0.782.

**Regression Weights: (Group number 1 - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| ae15opi3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.463 | .172 | 8.524 | *** | par_1 |
| ae14ope3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.307 | .164 | 7.947 | *** | par_2 |
| ae13opa3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.263 | .171 | 7.376 | *** | par_3 |
| ae9opbe3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.380 | .162 | 8.502 | *** | par_4 |
| ae8opco3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.454 | .182 | 7.986 | *** | par_5 |
| ae5oppe3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.300 | .170 | 7.665 | *** | par_6 |
| ae4opfo3 | <--- | ENTREPRENEURIAL_ATTITUDE | 1.469 | .168 | 8.754 | *** | par_7 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.521 | .147 | 10.364 | *** | par_8 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.384 | .153 | 9.068 | *** | par_9 |
| v9intac1 | <--- | INTERNAL_VALUES | 1.492 | .167 | 8.941 | *** | par_10 |
| v8intre1 | <--- | INTERNAL_VALUES | 1.717 | .159 | 10.803 | *** | par_11 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.605 | .154 | 10.443 | *** | par_12 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.266 | .190 | 6.652 | *** | par_13 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.613 | .201 | 8.029 | *** | par_14 |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.592 | .174 | 9.154 | *** | par_15 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.336 | .143 | 9.342 | *** | par_16 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| ae15opi3 | <--- | ENTREPRENEURIAL_ATTITUDE | .744 |
| ae14ope3 | <--- | ENTREPRENEURIAL_ATTITUDE | .707 |
| ae13opa3 | <--- | ENTREPRENEURIAL_ATTITUDE | .669 |
| ae9opbe3 | <--- | ENTREPRENEURIAL_ATTITUDE | .743 |
| ae8opco3 | <--- | ENTREPRENEURIAL_ATTITUDE | .710 |
| ae5oppe3 | <--- | ENTREPRENEURIAL_ATTITUDE | .689 |
| ae4opfo3 | <--- | ENTREPRENEURIAL_ATTITUDE | .759 |
| v3extre1 | <--- | EXTERNAL_VALUES | .852 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .778 |
| v9intac1 | <--- | INTERNAL_VALUES | .770 |
| v8intre1 | <--- | INTERNAL_VALUES | .884 |
| v4intfu1 | <--- | INTERNAL_VALUES | .863 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .701 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .881 |
| v5extre1 | <--- | EXTERNAL_VALUES | .783 |
| v7extse1 | <--- | EXTERNAL_VALUES | .794 |

**Squared Multiple Correlations: (Group number 1 - Default model)**

| | Estimate |
|---|---|
| v2funex1 | .775 |
| v6funfu1 | .492 |
| v4intfu1 | .746 |
| v8intre1 | .782 |
| v9intac1 | .593 |
| v1extbe1 | .605 |
| v3extre1 | .726 |
| v5extre1 | .613 |
| v7extse1 | .630 |
| ae4opfo3 | .575 |
| ae5oppe3 | .474 |
| ae8opco3 | .504 |
| ae9opbe3 | .552 |
| ae13opa3 | .447 |
| ae14ope3 | .500 |
| ae15opi3 | .554 |

**Exhibit 4.121: Scalars for the Combined Measurement Model at $T_3$ (*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 4.122 presents the results of the CFA of the Combined Measurement Model (using Maximum Likelihood estimation on the covariance matrix) at $T_1$. Since all results are within the acceptable levels, there is a good fit of the data to the hypothesized four factor Combined Measurement Model at $T_2$ for the Non-Entrepreneur Group.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 17.902 with df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0269 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.1145 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 4.122: Model Fit Statistics for the Combined Measurement Model at $T_3$ (*Non-Entrepreneurs*)**

**Discriminant Validity**: In this section, the results of the discriminant analyses for the six factor inter-relationships are presented. Exhibit 4.123 presents the correlations between the respective factors.

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .513 |
| ENTREPRENEURIAL_ATTITUDE | <--> | EXTERNAL_VALUES | .105 |
| EXTERNAL_VALUES | <--> | INTERNAL_VALUES | .285 |
| INTERNAL_VALUES | <--> | INTERPERSONAL_VALUES | .264 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERPERSONAL_VALUES | -.179 |
| ENTREPRENEURIAL_ATTITUDE | <--> | INTERNAL_VALUES | .146 |

**Exhibit 4.123: Factor Correlations at $T_3$ (*Non-Entrepreneurs*)**

Using the correlations generated for each of the respective inter-relationships, Exhibit 4.124 presents the discriminant analyses for the six factor relationships (the discriminant analyses results for the External, Internal, and Interpersonal Values are reproduced here for completeness). To calculate the extent to which the factors are empirically distinguishable (that is, to determine their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). Inspection of the structure coefficients for each of the factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items (that is, the structure coefficients for each respective factor of interest is greater than the structure coefficients of the alternative factor being compared). Hence, it can be concluded that the each of the factors displays discriminant validity.

| Indicator Variables | Internal Values1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre1 | 0* | 0.223 | 0.783 | **0.783** |
| v3extre1 | 0* | 0.243 | 0.852 | **0.852** |
| v1extbe1 | 0* | 0.222 | 0.778 | **0.778** |
| v8intre1 | 0.884 | **0.884** | 0* | 0.252 |
| v4intfu1 | 0.863 | **0.863** | 0* | 0.246 |
| v7extse1 | 0* | 0.226 | 0.794 | **0.794** |
| v9intac1 | 0.770 | **0.770** | 0* | 0.219 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre1 | 0* | 0.402 | 0.783 | **0.783** |
| v3extre1 | 0* | 0.437 | 0.852 | **0.852** |
| v1extbe1 | 0* | 0.399 | 0.778 | **0.778** |
| v6funfu1 | 0.863 | **0.863** | 0* | 0.443 |
| v2funex1 | 0.701 | **0.701** | 0* | 0.360 |
| v7extse1 | 0* | 0.407 | 0.794 | **0.794** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Interpersonal Values1 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.228 | 0.863 | **0.863** |
| v8intre1 | 0* | 0.233 | 0.884 | **0.884** |
| v9intac1 | 0* | 0.203 | 0.770 | **0.770** |
| v6funfu2 | 0.863 | **0.863** | 0* | 0.228 |
| v2funex2 | 0.701 | **0.701** | 0* | 0.185 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude3 | | External Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v1extbe | 0* | 0.082 | **0.778** | **0.778** |
| v3extre1 | 0* | 0.089 | **0.852** | **0.852** |
| v5extre1 | 0* | 0.082 | 0.783 | **0.783** |
| v7extse1 | 0* | 0.083 | 0.794 | **0.794** |
| ae4opfo3 | 0.759 | **0.759** | 0* | 0.080 |
| ae5oppe3 | 0.689 | **0.689** | 0* | 0.072 |
| ae8opco3 | 0.710 | **0.710** | 0* | 0.075 |
| ae9opbe3 | 0.743 | **0.743** | 0* | 0.078 |
| ae13opa3 | 0.669 | **0.669** | 0* | 0.070 |
| ae14ope3 | 0.707 | **0.707** | 0* | 0.074 |
| ae15opi3 | 0.744 | **0.744** | 0* | 0.078 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude3 | | Internal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v4intfu1 | 0* | 0.126 | 0.863 | **0.863** |
| v8intre1 | 0* | 0.129 | 0.884 | **0.884** |
| v9intac1 | 0* | 0.112 | 0.770 | **0.770** |
| ae4opfo3 | 0.759 | **0.759** | 0* | 0.111 |
| ae5oppe3 | 0.689 | **0.689** | 0* | 0.101 |
| ae8opco3 | 0.710 | **0.710** | 0* | 0.104 |
| ae9opbe3 | 0.743 | **0.743** | 0* | 0.108 |
| ae13opa3 | 0.669 | **0.669** | 0* | 0.098 |
| ae14ope3 | 0.707 | **0.707** | 0* | 0.103 |
| ae15opi3 | 0.744 | **0.744** | 0* | 0.109 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

| Indicator Variables | Entrepreneurial Attitude3 | | Interpersonal Values1 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v2funex1 | 0* | -0.125 | 0.701 | **0.701** |
| v6funfu1 | 0* | -0.154 | 0.863 | **0.863** |
| ae4opfo3 | 0.759 | **0.759** | 0* | -0.136 |
| ae5oppe3 | 0.689 | **0.689** | 0* | -0.123 |
| ae8opco3 | 0.710 | **0.710** | 0* | -0.127 |
| ae9opbe3 | 0.743 | **0.743** | 0* | -0.133 |
| ae13opa3 | 0.669 | **0.669** | 0* | -0.120 |
| ae14ope3 | 0.707 | **0.707** | 0* | -0.127 |
| ae15opi3 | 0.744 | **0.744** | 0* | -0.133 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 4.124: Factor Pattern and Structure Coefficients for the Six Factor Inter-Relationships @ $T_3$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

## 3.4 Invariance Testing

Invariance testing helps to answer the question as to whether test scores are the same for individuals who belong to different populations. In other words, is an hypothesised factor model similar or dissimilar across, say, two groups? To test for this, two separate groups of analyses are conducted. The first analysis involves developing an *unconstrained or baseline model* in which the parameter matrices of the models for the two groups are not constrained to be equal to each other. The second analysis involves developing a *constrained model* where the factor loadings and covariances between the factors are made to be equal. A Chi-square difference test is then undertaken between the two models. If the Chi-square difference test is not significant, we can conclude that the models are the same for both groups – that there is invariance between groups. The following section presents the results of the invariance testing undertaken for the Nascent and Non-Entrepreneur Groups. The first section examines group invariance at each point in time. The second section presents the results of invariance testing for each group across time to ensure that each group interpreted the survey questionnaire in a similar manner over time.

### 3.4.1 Invariance Testing at Each Point in Time – *Both Groups*

Exhibit 4.125 presents the results of the invariance tests performed at each point in time. This involved setting up two groups in AMOS using the Manage Groups command (Nascent and Non-Entrepreneurs) and running the analysis to produce the unconstrained or baseline Chi-square for the relevant latent variable. Next, each of the loadings is constrained and the model is run again. The Chi-square produced from this second constrained analysis is then compared to the unconstrained/baseline analysis Chi-square. These results are reflected in Exhibit 4.125.

#### Entrepreneurial Attitude

| EAOR ENTREPRENEUR vs NON-ENTREPRENEUR INVARIANCE @ T1 | | | | |
|---|---|---|---|---|
| **Details** | | **df** | **Value** | **p** |
| $\chi2$ | Constrained Model | 34 | 21.143 | |
| $\chi2$ | Baseline Model | 28 | 17.318 | |
| **$\chi2$** | **Difference** | **6** | **3.825** | **0.700** |
| *Conclusion: The $\chi2$ difference p value is non-significant; Therefore metric invariance is established.* | | | | |

| EAOR ENTREPRENEUR vs NON-ENTREPRENEUR INVARIANCE @ T2 | | | | |
|---|---|---|---|---|
| **Details** | | **df** | **Value** | **p** |
| $\chi2$ | Constrained Model | 34 | 13.604 | |
| $\chi2$ | Baseline Model | 28 | 6.730 | |
| **$\chi2$** | **Difference** | **6** | **6.874** | **0.333** |
| *Conclusion: The $\chi2$ difference p value is non-significant; Therefore metric invariance is established.* | | | | |

| EAOR ENTREPRENEUR vs NON-ENTREPRENEUR INVARIANCE @ T3 | | | | |
|---|---|---|---|---|
| **Details** | | **df** | **Value** | **p** |
| $\chi2$ | Constrained Model | 34 | 10.191 | |
| $\chi2$ | Baseline Model | 28 | 7.111 | |
| **$\chi2$** | **Difference** | **6** | **3.080** | **0.799** |
| *Conclusion: The $\chi2$ difference p value is non-significant; Therefore metric invariance is established.* | | | | |

#### Values

| EXTERNAL VALUES ENTREPRENEUR vs NON-ENTREPRENEUR INVARIANCE @ T1 | | | | |
|---|---|---|---|---|
| **Details** | | **df** | **Value** | **p** |
| $\chi2$ | Constrained Model | 7 | 9.794 | |
| $\chi2$ | Baseline Model | 4 | 3.741 | |
| **$\chi2$** | **Difference** | **3** | **6.053** | **0.109** |
| *Conclusion: The $\chi2$ difference p value is non-significant; Therefore metric invariance is established.* | | | | |

| INTERNAL VALUES ENTREPRENEUR vs NON-ENTREPRENEUR INVARIANCE @ T1 | | | | |
|---|---|---|---|---|
| **Details** | | **df** | **Value** | **p** |
| $\chi2$ | Constrained Model | 31 | 22.143 | |
| $\chi2$ | Baseline Model | 26 | 11.399 | |
| **$\chi2$** | **Difference** | **5** | **10.744** | **0.057** |
| *Conclusion: The $\chi2$ difference p value is non-significant; Therefore metric invariance is established.* | | | | |

| INTERPERSONAL VALUES ENTREPRENEUR vs NON-ENTREPRENEUR INVARIANCE @ T1 | | | | |
|---|---|---|---|---|
| Details | | df | Value | p |
| χ2 | Constrained Model | 20 | 13.171 | |
| χ2 | Baseline Model | 16 | 5.740 | |
| **χ2** | **Difference** | **4** | **7.431** | **0.115** |
| *Conclusion: The χ2 difference p value is non-significant; Therefore metric invariance is established.* | | | | |

**Exhibit 4.125: Invariance Test Results at $T_1$, $T_2$, & $T_3$: Differences at Each Point in Time**

As can be seen from the analyses undertaken, none of the Chi-square difference tests were significant. This indicates that there was metric invariance between groups for Entrepreneurial Attitude at $T_1$, $T_2$, and $T_3$ and for Values at $T_1$. Thus, the groups are equivalent and it can be concluded that each group interpreted the survey questionnaire in a similar manner.

### 3.4.2 Invariance Testing Over Time – *Nascent Entrepreneurs*

Exhibit 4.126 presents the Nascent Entrepreneur results of the invariance tests performed between each point in time. This test is performed to ensure that there was consistency of the group in interpreting the survey questionnaire over time.

| EAOR TIME INVARIANCE T1-T2 (Nascent Entrepreneurs) | | | | |
|---|---|---|---|---|
| Details | | df | Value | p |
| χ2 | Constrained Model | 34 | 26.863 | |
| χ2 | Baseline Model | 28 | 20.938 | |
| **χ2** | **Difference** | **6** | **5.925** | **0.432** |
| *Conclusion: The χ2 difference p value is non-significant; Therefore metric invariance is established.* | | | | |

| EAOR TIME INVARIANCE T2-T3 (Nascent Entrepreneurs) | | | | |
|---|---|---|---|---|
| Details | | df | Value | p |
| χ2 | Constrained Model | 34 | 13.660 | |
| χ2 | Baseline Model | 28 | 11.757 | |
| **χ2** | **Difference** | **6** | **1.903** | **0.928** |
| *Conclusion: The χ2 difference p value is non-significant; Therefore metric invariance is established.* | | | | |

| EAOR TIME INVARIANCE T1-T3 (Nascent Entrepreneurs) | | | | |
|---|---|---|---|---|
| Details | | df | Value | p |
| χ2 | Constrained Model | 34 | 22.141 | |
| χ2 | Baseline Model | 28 | 20.229 | |
| **χ2** | **Difference** | **6** | **1.912** | **0.928** |
| *Conclusion: The χ2 difference p value is non-significant; Therefore metric invariance is established.* | | | | |

**Exhibit 4.126: Invariance Test Results at $T_1$, $T_2$, & $T_3$: Differences between Points in Time (*Nascent Entrepreneurs*)**

As can be seen from the Chi-square difference test results, none were significant. This indicates metric invariance within the Nascent Entrepreneur Group over time.

### 3.4.3 Invariance Testing Over Time – *Non-Entrepreneurs*

Exhibit 4.127 presents the Non-Entrepreneur results of the invariance tests performed between each point in time. This test is performed to ensure that there was consistency of the group in interpreting the survey questionnaire over time.

**EAOR TIME INVARIANCE T1-T2 (Non-Entrepreneurs)**

| Details | | df | Value | p |
|---|---|---|---|---|
| $\chi 2$ | Constrained Model | 34 | 6.666 | |
| $\chi 2$ | Baseline Model | 28 | 3.130 | |
| **$\chi 2$** | **Difference** | **6** | **3.536** | **0.739** |

***Conclusion: The $\chi 2$ difference p value is non-significant; Therefore metric invariance is established.***

**EAOR TIME INVARIANCE T2-T3 (Non-Entrepreneurs)**

| Details | | df | Value | p |
|---|---|---|---|---|
| $\chi 2$ | Constrained Model | 34 | 8.368 | |
| $\chi 2$ | Baseline Model | 28 | 2.093 | |
| **$\chi 2$** | **Difference** | **6** | **6.275** | **0.393** |

***Conclusion: The $\chi 2$ difference p value is non-significant; Therefore metric invariance is established.***

**EAOR TIME INVARIANCE T1-T3 (Non-Entrepreneurs)**

| Details | | df | Value | p |
|---|---|---|---|---|
| $\chi 2$ | Constrained Model | 34 | 7.133 | |
| $\chi 2$ | Baseline Model | 28 | 4.213 | |
| **$\chi 2$** | **Difference** | **6** | **2.920** | **0.819** |

***Conclusion: The $\chi 2$ difference p value is non-significant; Therefore metric invariance is established.***

**Exhibit 4.127: Invariance Test Results at $T_1$, $T_2$, & $T_3$: Differences between Points in Time (*Non-Entrepreneurs*)**

As can be seen from the Chi-square difference test results, none were significant. This indicates metric invariance within the Non-Entrepreneur Group over time.

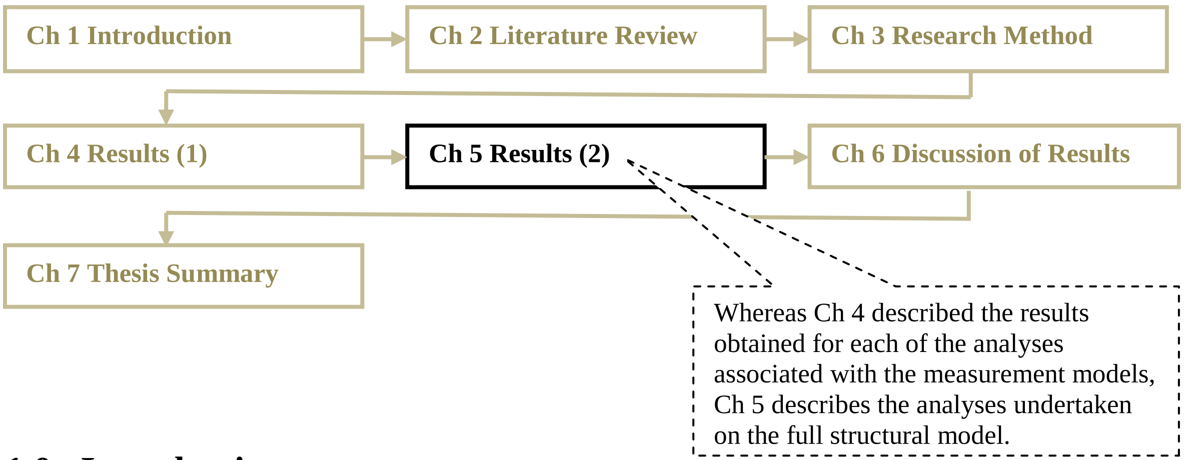
## 4.0 Chapter Summary

Chapter 4 provides details of the research results for the analyses up to those associated with the full structural model (these appear in Chapter 5). The Chapter was divided into two sections: preliminary analyses and advanced analyses. The preliminary analysis section presented the means and standard deviations of the underlying dimensions for the values, entrepreneurial attitude, entrepreneurial intention, and business start-up behaviour variables.

It also presented the paired samples tests (that were used to determine whether there were significant changes in the means over time) for each of the variables and independent samples t-tests (to determine whether there were differences between the two groups with regard to the variables of interest at each point in time).

In the advanced analyses section, the results of assessments of normality were presented for each of the constructs along with the Chi-square and Bollen-Stine p statistics. In this section, the one factor congeneric measurement models were presented and analysed (this step involved confirmatory factor analyses of the individual measurement models). Where there were less than four items relating to a particular construct, constructs were paired with another construct to enable the analyses to proceed (when there are less than four items, there is insufficient degrees of freedom to proceed with an analysis for a construct unless it is paired). Where items were paired, discriminant analyses were undertaken. All discriminant analyses demonstrated discrete factors – there were no cross-loadings between factor dimensions. Confirmatory factor analyses and discriminant analyses were also presented of the combined construct dimensions for each group. These evaluated possible item cross-loading across constructs. No cross loadings were identified. Finally, the results of the invariance testing were presented. Invariance testing was undertaken to determine whether each group interpreted the results in a similar manner.

# Chapter 5
# Results (2)
# Structural Modeling




## 1.0 Introduction

Chapter 5 presents the results of the data analyses undertaken in this research that are associated with the full structural model. This model was run using the data sets collected at $T_1$, $T_2$, and $T_3$ for the Nascent and Non-Entrepreneur Groups. Structural equation modeling using AMOS was primarily used in these analyses. The Chapter presents the full structural model and then presents a reduced model where items are parcelled up to form composites to replace the individual items associated with the Entrepreneurial Attitude latent variable. There has been criticism about the use of composites and so the pros and cons are discussed as to whether to use the composite model in this research. Finally, moderating variable tests are undertaken that examine the factor loadings among variables to determine if nascent versus non-entrepreneur group membership affects the relationships among the model variables.

## 2.0 Full Structural Model

Exhibit 5.1 presents the full structural model for the variables of interest: values, entrepreneurial attitude, entrepreneurial start-up intention, and business start-up behaviour together with their respective items. This model is examined from the perspective of both groups: Nascent and Non-Entrepreneurs. Error terms are correlated (there are lines drawn between the error terms in the model) since entrepreneurial attitude and entrepreneurial intention at $T_3$ will be related to entrepreneurial attitude at $T_1$ and $T_2$. Based on the underlying theory, the model depicts the following relationships:

(1) Values (INTERNAL, EXTERNAL, AND INTERPERSONAL) influence Entrepreneurial Attitude (EAOR1, EAOR2, and EAOR3) and Business Start-Up Behaviour (operbiz) at $T_3$

(2) Entrepreneurial Attitude (EAOR1, EAOR2, and EAOR3) influences Entrepreneurial Intention (intent1, intent2, and intent3), and

(3) Entrepreneurial Intention (EAOR1, EAOR2, and EAOR3) influence Business Start-Up Behaviour (operbiz) at $T_3$.

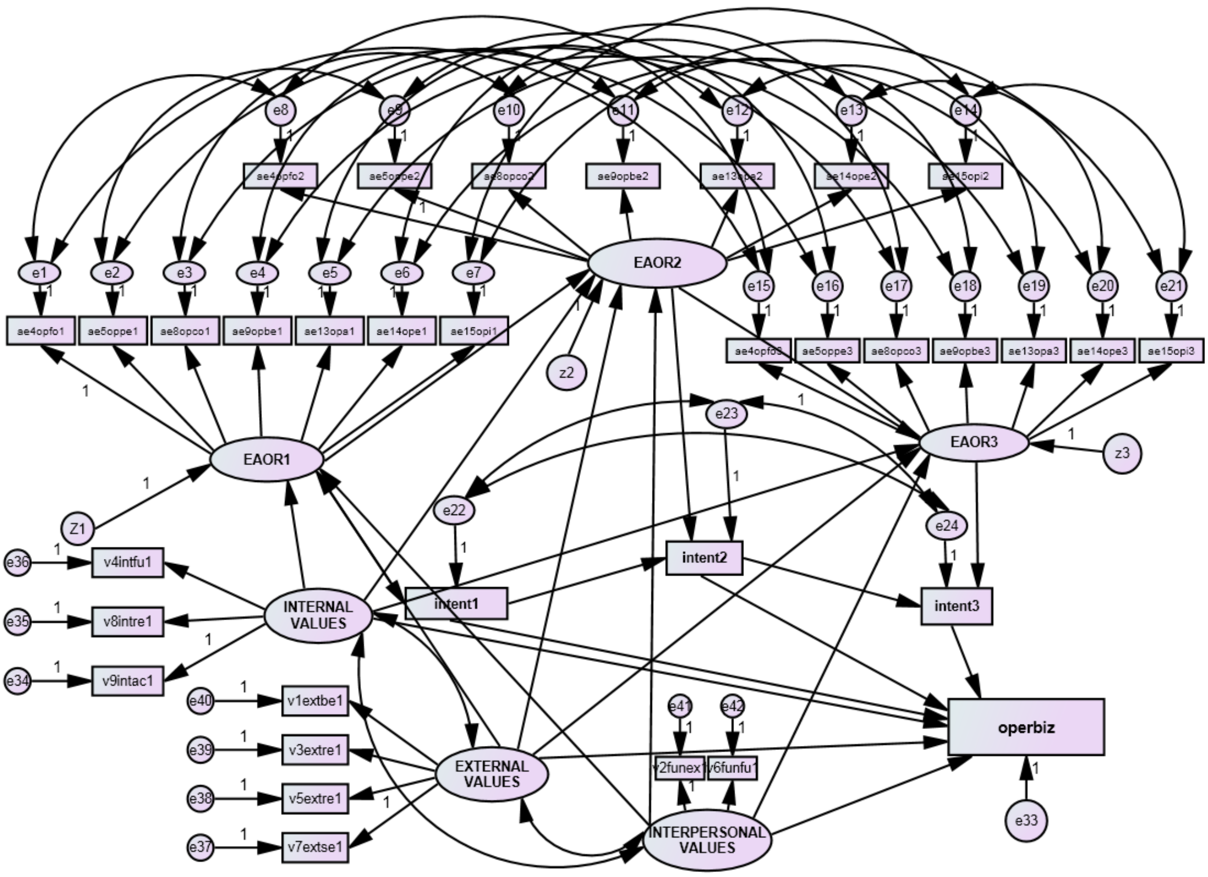



**Exhibit 5.1: Full Structural Model**

The following section examines the full structural model in terms of the results produced for the Nascent and Non-Entrepreneur Groups. Exhibit 5.2 presents the model fit indices for the structural model that encompasses both the Nascent and Non-Entrepreneur Groups. As can be seen, the data fits the model.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 508.330 with 964 df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0291 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.052 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 5.2: Model Fit Statistics for the Full Structural Model**

## 2.1 Full Structural Model – *Nascent Entrepreneurs*

Exhibit 5.3 presents the full structural model for the Nascent Entrepreneur Group.

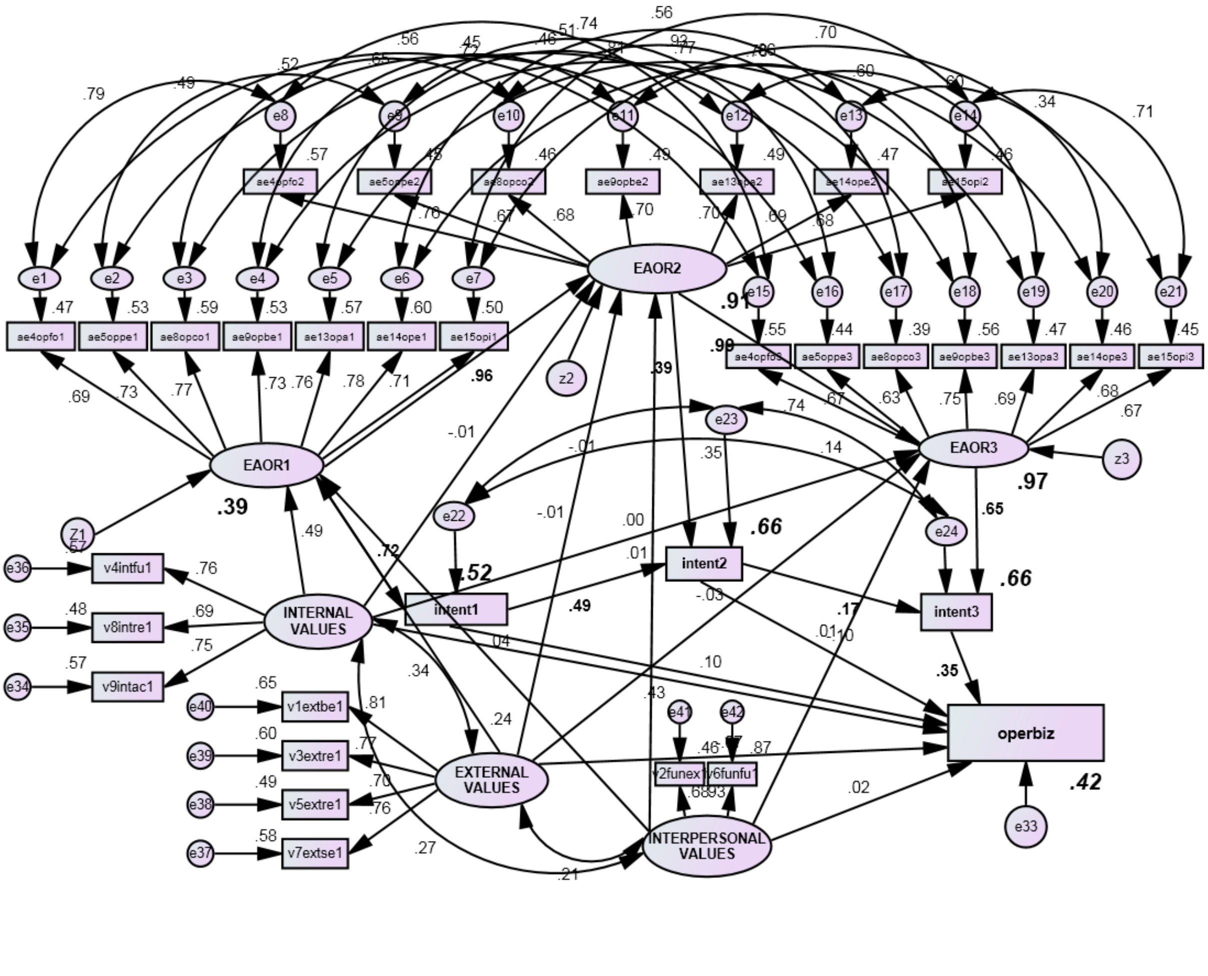



**Exhibit 5.3: Full Structural Model**
***(Nascent Entrepreneurs)***

Exhibit 5.4 presents the regression weights, standardized regression weights, and squared multiple correlations for the Nascent Entrepreneur Group. Of note is that 42% of the Business Start-Up Behaviour (operbiz) variance is explained in the model.

**Regression Weights: (1 Nascent Entrepreneurs - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .428 | .069 | 6.243 | *** | par_51 |
| EAOR1 | <--- | EXTERNAL_VALUES | .236 | .064 | 3.722 | *** | par_56 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | .044 | .064 | .688 | .492 | par_65 |
| EAOR2 | <--- | EXTERNAL_VALUES | -.006 | .026 | -.232 | .817 | par_59 |
| EAOR2 | <--- | INTERNAL_VALUES | -.004 | .028 | -.144 | .886 | par_62 |
| intent1 | <--- | EAOR1 | .506 | .044 | 11.439 | *** | par_63 |
| EAOR2 | <--- | EAOR1 | .868 | .045 | 19.446 | *** | par_70 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | .010 | .026 | .368 | .713 | par_72 |
| intent2 | <--- | intent1 | .493 | .218 | 2.263 | .024 | par_40 |
| EAOR3 | <--- | INTERNAL_VALUES | .002 | .020 | .074 | .941 | par_58 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.022 | .019 | -1.159 | .246 | par_60 |
| intent2 | <--- | EAOR2 | .307 | .123 | 2.503 | .012 | par_61 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | .008 | .019 | .435 | .663 | par_66 |
| EAOR3 | <--- | EAOR2 | .976 | .043 | 22.501 | *** | par_71 |
| intent3 | <--- | intent2 | .174 | .290 | .599 | .549 | par_41 |
| intent3 | <--- | EAOR3 | .528 | .172 | 3.060 | .002 | par_42 |
| ae4opfo1 | <--- | EAOR1 | 1.000 | | | | |
| ae5oppe1 | <--- | EAOR1 | 1.089 | .094 | 11.590 | *** | par_1 |
| ae8opco1 | <--- | EAOR1 | 1.144 | .094 | 12.163 | *** | par_2 |
| ae9opbe1 | <--- | EAOR1 | 1.071 | .090 | 11.852 | *** | par_3 |
| ae13opa1 | <--- | EAOR1 | 1.105 | .090 | 12.293 | *** | par_4 |
| ae14ope1 | <--- | EAOR1 | 1.270 | .102 | 12.508 | *** | par_5 |
| ae9opbe3 | <--- | EAOR3 | 1.033 | .079 | 13.074 | *** | par_6 |
| ae13opa3 | <--- | EAOR3 | 1.014 | .085 | 11.945 | *** | par_7 |
| ae14ope3 | <--- | EAOR3 | 1.132 | .097 | 11.667 | *** | par_8 |
| ae15opi3 | <--- | EAOR3 | 1.034 | .089 | 11.621 | *** | par_9 |
| ae5oppe2 | <--- | EAOR2 | .985 | .084 | 11.747 | *** | par_11 |
| ae8opco2 | <--- | EAOR2 | 1.069 | .090 | 11.926 | *** | par_12 |
| ae9opbe2 | <--- | EAOR2 | .989 | .079 | 12.483 | *** | par_13 |
| ae13opa2 | <--- | EAOR2 | 1.076 | .086 | 12.481 | *** | par_14 |
| ae14ope2 | <--- | EAOR2 | 1.023 | .085 | 12.012 | *** | par_15 |
| ae15opi2 | <--- | EAOR2 | 1.072 | .090 | 11.866 | *** | par_16 |
| ae4opfo2 | <--- | EAOR2 | 1.000 | | | | |
| ae8opco3 | <--- | EAOR3 | 1.021 | .096 | 10.603 | *** | par_37 |
| ae5oppe3 | <--- | EAOR3 | .989 | .087 | 11.364 | *** | par_38 |
| ae4opfo3 | <--- | EAOR3 | 1.000 | | | | |
| operbiz | <--- | intent3 | .547 | .119 | 4.604 | *** | par_43 |
| operbiz | <--- | intent2 | -.161 | .129 | -1.251 | .211 | par_44 |
| operbiz | <--- | intent1 | .166 | .122 | 1.356 | .175 | par_45 |
| v9intac1 | <--- | INTERNAL_VALUES | 1.000 | | | | |
| v8intre1 | <--- | INTERNAL_VALUES | .854 | .083 | 10.241 | *** | par_46 |
| v4intfu1 | <--- | INTERNAL_VALUES | .958 | .088 | 10.926 | *** | par_47 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.000 | | | | |
| v5extre1 | <--- | EXTERNAL_VALUES | .912 | .081 | 11.253 | *** | par_48 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.058 | .086 | 12.366 | *** | par_49 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.143 | .089 | 12.778 | *** | par_50 |
| operbiz | <--- | INTERNAL_VALUES | .419 | .069 | 6.049 | *** | par_52 |
| ae15opi1 | <--- | EAOR1 | 1.165 | .102 | 11.456 | *** | par_57 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.000 | | | | |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.377 | .315 | 4.377 | *** | par_64 |
| operbiz | <--- | INTERPERSONAL_VALUES | .029 | .064 | .455 | .649 | par_67 |
| operbiz | <--- | EXTERNAL_VALUES | -.072 | .062 | -1.157 | .247 | par_68 |

**Standardized Regression Weights: (1 Nascent Entrepreneurs - Default model)**

| | | | Estimate |
|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .486 |
| EAOR1 | <--- | EXTERNAL_VALUES | .244 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | .041 |
| EAOR2 | <--- | EXTERNAL_VALUES | -.007 |
| EAOR2 | <--- | INTERNAL_VALUES | -.005 |
| intent1 | <--- | EAOR1 | .724 |
| EAOR2 | <--- | EAOR1 | .959 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | .010 |
| intent2 | <--- | intent1 | .488 |
| EAOR3 | <--- | INTERNAL_VALUES | .002 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.025 |
| intent2 | <--- | EAOR2 | .395 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | .009 |
| EAOR3 | <--- | EAOR2 | .992 |
| intent3 | <--- | intent2 | .170 |
| intent3 | <--- | EAOR3 | .653 |
| ae4opfo1 | <--- | EAOR1 | .685 |
| ae5oppe1 | <--- | EAOR1 | .728 |
| ae8opco1 | <--- | EAOR1 | .765 |
| ae9opbe1 | <--- | EAOR1 | .725 |
| ae13opa1 | <--- | EAOR1 | .756 |
| ae14ope1 | <--- | EAOR1 | .778 |
| ae9opbe3 | <--- | EAOR3 | .747 |
| ae13opa3 | <--- | EAOR3 | .686 |
| ae14ope3 | <--- | EAOR3 | .677 |
| ae15opi3 | <--- | EAOR3 | .673 |
| ae5oppe2 | <--- | EAOR2 | .670 |
| ae8opco2 | <--- | EAOR2 | .681 |
| ae9opbe2 | <--- | EAOR2 | .703 |
| ae13opa2 | <--- | EAOR2 | .700 |
| ae14ope2 | <--- | EAOR2 | .687 |
| ae15opi2 | <--- | EAOR2 | .675 |
| ae4opfo2 | <--- | EAOR2 | .757 |
| ae8opco3 | <--- | EAOR3 | .625 |
| ae5oppe3 | <--- | EAOR3 | .666 |
| ae4opfo3 | <--- | EAOR3 | .744 |
| operbiz | <--- | intent3 | .353 |
| operbiz | <--- | intent2 | -.102 |
| operbiz | <--- | intent1 | .104 |
| v9intac1 | <--- | INTERNAL_VALUES | .752 |
| v8intre1 | <--- | INTERNAL_VALUES | .690 |
| v4intfu1 | <--- | INTERNAL_VALUES | .756 |
| v7extse1 | <--- | EXTERNAL_VALUES | .759 |
| v5extre1 | <--- | EXTERNAL_VALUES | .702 |
| v3extre1 | <--- | EXTERNAL_VALUES | .774 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .805 |
| operbiz | <--- | INTERNAL_VALUES | .427 |
| ae15opi1 | <--- | EAOR1 | .708 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .682 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .932 |
| operbiz | <--- | INTERPERSONAL_VALUES | .024 |
| operbiz | <--- | EXTERNAL_VALUES | -.066 |

**Squared Multiple Correlations: (1 Nascent Entrepreneurs - Default model)**

| | Estimate |
|---|---|
| EAOR1 | .394 |
| intent1 | .524 |
| EAOR2 | .913 |
| intent2 | .657 |
| EAOR3 | .971 |
| intent3 | .655 |
| v6funfu1 | .870 |
| v2funex1 | .465 |
| v1extbe1 | .649 |
| v3extre1 | .599 |
| v5extre1 | .493 |
| v7extse1 | .575 |
| v4intfu1 | .571 |
| v8intre1 | .476 |
| v9intac1 | .566 |
| operbiz | .419 |
| ae15opi2 | .456 |
| ae14ope2 | .472 |
| ae13opa2 | .490 |
| ae9opbe2 | .495 |
| ae8opco2 | .463 |
| ae5oppe2 | .449 |
| ae4opfo2 | .573 |
| ae15opi3 | .454 |
| ae14ope3 | .459 |
| ae13opa3 | .471 |
| ae9opbe3 | .557 |
| ae8opco3 | .391 |
| ae5oppe3 | .443 |
| ae4opfo3 | .553 |
| ae15opi1 | .502 |
| ae14ope1 | .605 |
| ae13opa1 | .572 |
| ae9opbe1 | .526 |
| ae8opco1 | .586 |
| ae5oppe1 | .529 |
| ae4opfo1 | .470 |

**Exhibit 5.4: Regression Weights, Standardized Regression Weights, and Squared Multiple Correlations (*Nascent Entrepreneurs*)**

Exhibit 5.5 identifies those variable relationships that are not significant. Since there are no Interpersonal Values relationships that are significant for the Nascent Entrepreneur Group, this variable should be dropped from the model. Since there are no Interpersonal Values relationships that are significant for the Nascent Entrepreneur Group, this variable should be dropped from the model.

| | | |
|---|---|---|
| EAOR1 | <--- | INTERPERSONAL_VALUES |
| EAOR2 | <--- | EXTERNAL_VALUES |
| EAOR2 | <--- | INTERNAL_VALUES |
| EAOR2 | <--- | INTERPERSONAL_VALUES |

| | | |
|---|---|---|
| EAOR3 | <--- | INTERNAL_VALUES |
| EAOR3 | <--- | EXTERNAL_VALUES |
| EAOR3 | <--- | INTERPERSONAL_VALUES |
| intent3 | <--- | intent2 |
| operbiz | <--- | intent2 |
| operbiz | <--- | intent1 |
| operbiz | <--- | INTERPERSONAL_VALUES |
| operbiz | <--- | EXTERNAL_VALUES |

**Exhibit 5.5: Non-Significant Relationships Identified**
**(*Nascent Entrepreneurs*)**

## 2.2 Full Structural Model – *Non-Entrepreneurs*

Exhibit 5.6 presents the full structural model for the Non-Entrepreneur Group.

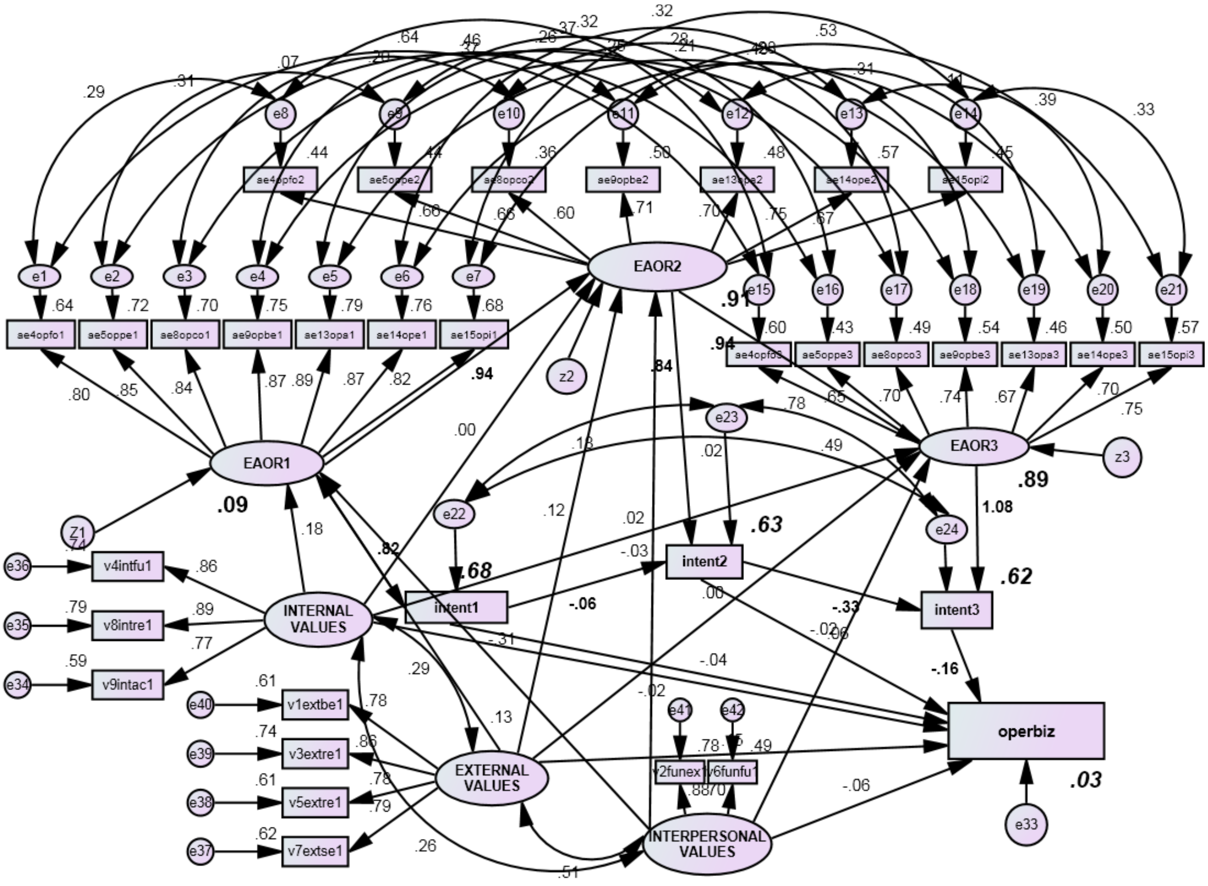



**Exhibit 5.6: Full Structural Model**
***(Non-Entrepreneurs)***

Exhibit 5.7 presents the regression weights, standardized regression weights, and squared multiple correlations for the Non-Entrepreneur Group. Of note is that only 3% of the Business Start-Up Behaviour (operbiz) variance is explained in the model.

**Regression Weights: (2 Non-Entrepreneurs - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .199 | .120 | 1.662 | .097 | par_124 |
| EAOR1 | <--- | EXTERNAL_VALUES | .154 | .159 | .970 | .332 | par_129 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | -.312 | .146 | -2.143 | .032 | par_138 |
| EAOR2 | <--- | EXTERNAL_VALUES | .100 | .053 | 1.871 | .061 | par_132 |
| EAOR2 | <--- | INTERNAL_VALUES | -.003 | .039 | -.066 | .948 | par_135 |
| intent1 | <--- | EAOR1 | .387 | .038 | 10.065 | *** | par_136 |
| EAOR2 | <--- | EAOR1 | .653 | .080 | 8.175 | *** | par_143 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | -.019 | .045 | -.420 | .675 | par_145 |
| intent2 | <--- | intent1 | -.046 | .224 | -.203 | .839 | par_113 |
| EAOR3 | <--- | INTERNAL_VALUES | .017 | .054 | .304 | .761 | par_131 |
| EAOR3 | <--- | EXTERNAL_VALUES | .001 | .073 | .011 | .991 | par_133 |
| intent2 | <--- | EAOR2 | .426 | .136 | 3.135 | .002 | par_134 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | -.017 | .063 | -.273 | .785 | par_139 |
| EAOR3 | <--- | EAOR2 | 1.259 | .156 | 8.051 | *** | par_144 |
| intent3 | <--- | intent2 | -.423 | .519 | -.815 | .415 | par_114 |
| intent3 | <--- | EAOR3 | .525 | .160 | 3.280 | .001 | par_115 |
| ae4opfo1 | <--- | EAOR1 | 1.000 | | | | |
| ae5oppe1 | <--- | EAOR1 | .995 | .093 | 10.663 | *** | par_74 |
| ae8opco1 | <--- | EAOR1 | .950 | .091 | 10.390 | *** | par_75 |
| ae9opbe1 | <--- | EAOR1 | 1.046 | .096 | 10.890 | *** | par_76 |
| ae13opa1 | <--- | EAOR1 | .992 | .088 | 11.311 | *** | par_77 |
| ae14ope1 | <--- | EAOR1 | 1.049 | .095 | 11.081 | *** | par_78 |
| ae9opbe3 | <--- | EAOR3 | .912 | .111 | 8.200 | *** | par_79 |
| ae13opa3 | <--- | EAOR3 | .851 | .116 | 7.341 | *** | par_80 |
| ae14ope3 | <--- | EAOR3 | .869 | .111 | 7.815 | *** | par_81 |
| ae15opi3 | <--- | EAOR3 | .986 | .115 | 8.549 | *** | par_82 |
| ae5oppe2 | <--- | EAOR2 | 1.171 | .188 | 6.245 | *** | par_84 |
| ae8opco2 | <--- | EAOR2 | 1.001 | .175 | 5.738 | *** | par_85 |
| ae9opbe2 | <--- | EAOR2 | 1.129 | .171 | 6.616 | *** | par_86 |
| ae13opa2 | <--- | EAOR2 | 1.019 | .156 | 6.522 | *** | par_87 |
| ae14ope2 | <--- | EAOR2 | 1.357 | .194 | 7.004 | *** | par_88 |
| ae15opi2 | <--- | EAOR2 | 1.169 | .184 | 6.346 | *** | par_89 |
| ae4opfo2 | <--- | EAOR2 | 1.000 | | | | |
| ae8opco3 | <--- | EAOR3 | .948 | .124 | 7.663 | *** | par_110 |
| ae5oppe3 | <--- | EAOR3 | .814 | .114 | 7.152 | *** | par_111 |
| ae4opfo3 | <--- | EAOR3 | 1.000 | | | | |
| operbiz | <--- | intent3 | -.168 | .144 | -1.166 | .244 | par_116 |
| operbiz | <--- | intent2 | .082 | .200 | .410 | .682 | par_117 |
| operbiz | <--- | intent1 | -.036 | .137 | -.265 | .791 | par_118 |
| v9intac1 | <--- | INTERNAL_VALUES | 1.000 | | | | |
| v8intre1 | <--- | INTERNAL_VALUES | 1.152 | .127 | 9.108 | *** | par_119 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.071 | .119 | 8.995 | *** | par_120 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.000 | | | | |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.191 | .143 | 8.345 | *** | par_121 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.152 | .124 | 9.267 | *** | par_122 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.042 | .125 | 8.338 | *** | par_123 |
| operbiz | <--- | INTERNAL_VALUES | -.012 | .058 | -.210 | .834 | par_125 |
| ae15opi1 | <--- | EAOR1 | .986 | .097 | 10.222 | *** | par_130 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.000 | | | | |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .782 | .160 | 4.900 | *** | par_137 |
| operbiz | <--- | INTERPERSONAL_VALUES | -.027 | .066 | -.414 | .679 | par_140 |
| operbiz | <--- | EXTERNAL_VALUES | .088 | .077 | 1.149 | .250 | par_141 |

**Standardized Regression Weights: (2 Non-Entrepreneurs - Default model)**

| | | | Estimate |
|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .185 |
| EAOR1 | <--- | EXTERNAL_VALUES | .127 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | -.313 |
| EAOR2 | <--- | EXTERNAL_VALUES | .118 |
| EAOR2 | <--- | INTERNAL_VALUES | -.003 |
| intent1 | <--- | EAOR1 | .824 |
| EAOR2 | <--- | EAOR1 | .939 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | -.027 |
| intent2 | <--- | intent1 | -.061 |
| EAOR3 | <--- | INTERNAL_VALUES | .016 |
| EAOR3 | <--- | EXTERNAL_VALUES | .001 |
| intent2 | <--- | EAOR2 | .844 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | -.019 |
| EAOR3 | <--- | EAOR2 | .940 |
| intent3 | <--- | intent2 | -.327 |
| intent3 | <--- | EAOR3 | 1.080 |
| ae4opfo1 | <--- | EAOR1 | .803 |
| ae5oppe1 | <--- | EAOR1 | .849 |
| ae8opco1 | <--- | EAOR1 | .839 |
| ae9opbe1 | <--- | EAOR1 | .865 |
| ae13opa1 | <--- | EAOR1 | .886 |
| ae14ope1 | <--- | EAOR1 | .872 |
| ae9opbe3 | <--- | EAOR3 | .737 |
| ae13opa3 | <--- | EAOR3 | .675 |
| ae14ope3 | <--- | EAOR3 | .705 |
| ae15opi3 | <--- | EAOR3 | .755 |
| ae5oppe2 | <--- | EAOR2 | .661 |
| ae8opco2 | <--- | EAOR2 | .604 |
| ae9opbe2 | <--- | EAOR2 | .707 |
| ae13opa2 | <--- | EAOR2 | .696 |
| ae14ope2 | <--- | EAOR2 | .752 |
| ae15opi2 | <--- | EAOR2 | .673 |
| ae4opfo2 | <--- | EAOR2 | .665 |
| ae8opco3 | <--- | EAOR3 | .697 |
| ae5oppe3 | <--- | EAOR3 | .653 |
| ae4opfo3 | <--- | EAOR3 | .775 |
| operbiz | <--- | intent3 | -.157 |
| operbiz | <--- | intent2 | .060 |
| operbiz | <--- | intent1 | -.035 |
| v9intac1 | <--- | INTERNAL_VALUES | .771 |
| v8intre1 | <--- | INTERNAL_VALUES | .887 |
| v4intfu1 | <--- | INTERNAL_VALUES | .861 |
| v7extse1 | <--- | EXTERNAL_VALUES | .790 |
| v5extre1 | <--- | EXTERNAL_VALUES | .778 |
| v3extre1 | <--- | EXTERNAL_VALUES | .858 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .778 |
| operbiz | <--- | INTERNAL_VALUES | -.023 |
| ae15opi1 | <--- | EAOR1 | .822 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .883 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .700 |
| operbiz | <--- | INTERPERSONAL_VALUES | -.057 |
| operbiz | <--- | EXTERNAL_VALUES | .150 |

**Squared Multiple Correlations: (2 Non-Entrepreneurs - Default model)**

| | Estimate |
|---|---|
| EAOR1 | .090 |
| intent1 | .679 |
| EAOR2 | .907 |
| intent2 | .628 |
| EAOR3 | .893 |
| intent3 | .620 |
| v6funfu1 | .489 |
| v2funex1 | .779 |
| v1extbe1 | .605 |
| v3extre1 | .736 |
| v5extre1 | .606 |
| v7extse1 | .625 |
| v4intfu1 | .741 |
| v8intre1 | .786 |
| v9intac1 | .594 |
| operbiz | .033 |
| ae15opi2 | .452 |
| ae14ope2 | .566 |
| ae13opa2 | .484 |
| ae9opbe2 | .500 |
| ae8opco2 | .365 |
| ae5oppe2 | .437 |
| ae4opfo2 | .442 |
| ae15opi3 | .570 |
| ae14ope3 | .497 |
| ae13opa3 | .455 |
| ae9opbe3 | .544 |
| ae8opco3 | .486 |
| ae5oppe3 | .427 |
| ae4opfo3 | .601 |
| ae15opi1 | .676 |
| ae14ope1 | .760 |
| ae13opa1 | .785 |
| ae9opbe1 | .748 |
| ae8opco1 | .703 |
| ae5oppe1 | .721 |
| ae4opfo1 | .644 |

**Exhibit 5.7: Regression Weights, Standardized Regression Weights, and Squared Multiple Correlations (*Non-Entrepreneurs*)**

Exhibit 5.8 identifies those variable relationships that are *not* significant.

| | | |
|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES |
| EAOR1 | <--- | EXTERNAL_VALUES |
| EAOR2 | <--- | EXTERNAL_VALUES |
| EAOR2 | <--- | INTERNAL_VALUES |
| EAOR2 | <--- | INTERPERSONAL_VALUES |
| intent2 | <--- | intent1 |
| EAOR3 | <--- | INTERNAL_VALUES |
| EAOR3 | <--- | EXTERNAL_VALUES |
| EAOR3 | <--- | INTERPERSONAL_VALUES |
| intent3 | <--- | intent2 |
| operbiz | <--- | intent3 |

| | | |
|---|---|---|
| operbiz | <--- | intent2 |
| operbiz | <--- | intent1 |
| operbiz | <--- | INTERPERSONAL_VALUES |
| operbiz | <--- | EXTERNAL_VALUES |

**Exhibit 5.8: Non-Significant Relationships Identified (*Non-Entrepreneurs*)**

## 3.0 Use of Composites

As previously discussed in Chapter 3, sample size can be an issue in a complex model. Sample size issues may be addressed through adopting the following:

(1) Where the repeated measures nature of the research demonstrated stable results over time (with the CFAs of the one factor congeneric measurement models and the CFA of the combined measurement models resulting in well-fitting models in all cases), and

(2) Through developing composites of the construct items.

### 3.1 Developing Composites

A limitation of structural equation modeling is that where there are a large number of latent variables with associated indicator items and observed variables, the number of parameters to be estimated is also large. In such situations, parameter estimation and model fit statistics may be unstable and it may be difficult to fit the model (which was not the case in this research as the data fit all measurement and full structural models).

*Dealing with the problem - Data reduction*: One approach to solving this problem is to apply a data reduction technique such as developing a composite of the items for each latent variable. This is useful where there are a relatively large number of indicator items for a construct since it increases the proportion of parameters estimated to sample size. This makes it an appealing technique when dealing with relatively smaller samples (see, for example, Bandalos, 2002; Little, Cunningham, Shahar, and Widaman, 2002).

*To use composites or not?* In this research, the use of composites was considered. This involved refining the initial full structural model to include composites for the relevant variables. After the refined full composite model was developed, this model was compared against the initial (non-composite) model to determine if there were any significant differences. A decision was then made as to whether the full non-composite model or the full composite model should be used.

*Which variables should be included as composites?* Because the number of indicator items for each of the Values factors was small (four items for External Values, three items for Internal Values, and two items for Interpersonal Values), it was not considered necessary to develop a composite for these items. Entrepreneurial Attitude has seven indicator items, however, and so it was not inappropriate to develop a composite for this latent variable.

*Unidimensionality requirement*: A requirement of parcelling up items to form composites is that each parcel of items must be unidimensional. In this research, Entrepreneurial Attitude at $T_1$, $T_2$, and $T_3$ was unidimensional (the confirmatory factor analyses of the one factor congeneric models demonstrated singular eigenvalues for the construct at each period of time). Thus, it is appropriate to consider parcelling up the Entrepreneurial Attitude items into a composite.

*How to aggregate? Congeneric versus parallel one factor models*: Whether the one factor individual measurement models are congeneric or parallel influences the way that the composites are developed. For *parallel models*, the average of a simple unit weight addition of the item scores that make up the construct is appropriate since all items are considered to contribute equally to the factor variance. For *congeneric models*, where the construct item factor loadings can vary freely, the factor score regression weights should be used to weight the contribution of each of the items (see, for example, Joreskog and Sorbom, 1989). In this research, it is assumed that the individual measurement models are congeneric rather than parallel since there is no compelling reason to assume that all factor loadings for a particular construct will have equal weightings.

*Calculating the composites*: Composites scale reliabilities are used to fix the composite variable regression coefficients and measurement error variances in a structural equation model. The following parameter estimates are required in the calculations using the parameter estimates from the one factor congeneric model analyses:

- Composite reliabilities – ideally, the reliability indicator, Coefficient H, should be used if the items are weighted by the factor score regression coefficients (such as for one factor congeneric models) or Cronbach's alpha if items are unit weighted (such as for parallel models) (Holmes-Smith, 2009)
- Composite standard deviations – these should be calculated using the factor score regression coefficients.

Once these are calculated, they can be fed into the following formulae to produce the requisite composite factor loading and composite factor error variances for the Entrepreneurial Attitude latent variable for each group:

$$\text{Factor Loading } (\lambda) = (s_x * \sqrt{r_x})$$

$$\text{Error Variance } (\theta) = (s_x^2 [1-r_x])$$

### 3.2. Entrepreneurial Attitude Composites - *Nascent Entrepreneur Group*

This section provides details of how the Entrepreneurial Attitude composites were calculated for the Nascent Entrepreneur Group.

### 3.2.1 Entrepreneurial Attitude Composite @ T1 - *Nascent Entrepreneur Group*

Exhibit 5.9 represents the Nascent Entrepreneur Group one factor measurement model for the Entrepreneurial Attitude latent variable at $T_1$. The standardized regression weights from this model are used in the composite calculations.

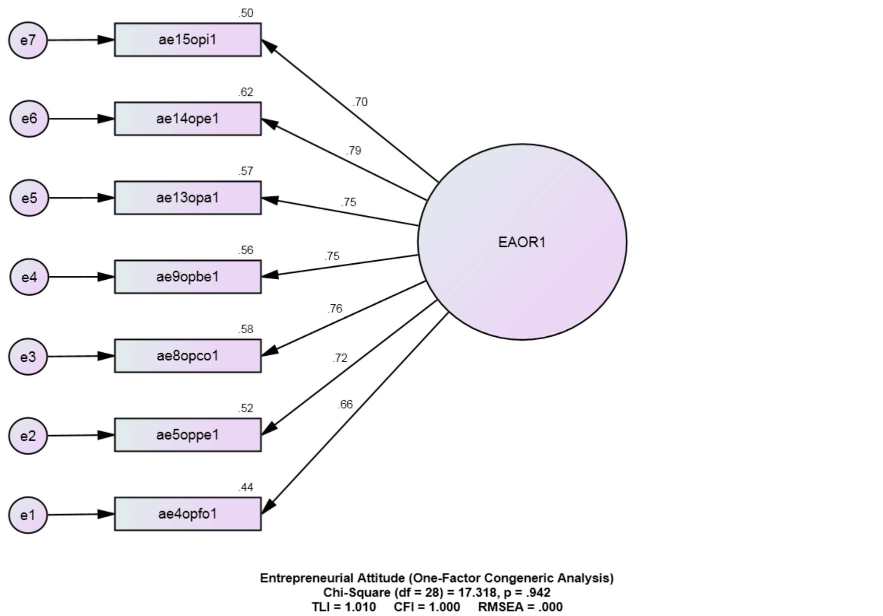



**Exhibit 5.9: Entrepreneurial Attitude One Factor Measurement Model at $T_1$ (*Nascent Entrepreneurs*)**

Exhibit 5.10 presents the worksheet used to calculate the Coefficient H reliability used to calculate the composites for the Nascent Entrepreneur Group at $T_1$. Underneath this appears, *for comparison purposes only*, the Cronbach Alpha reliability which was not used in the calculations because the models were considered “congeneric”. As can be seen, while using the Coefficient H reliability is technically correct for a congeneric model, there is little difference between the Coefficient H (0.894) and Cronbach Alpha (0.891) reliabilities.

| Coefficient H using Standardized Regression Weights | | |
|---|---|---|
| Variables | λ | Coefficient H |
| ae4opfo1 | 0.663 | |
| ae5oppe1 | 0.718 | |
| ae8opco1 | 0.764 | |
| ae9opbe1 | 0.750 | |
| ae13opa1 | 0.754 | |
| ae14ope1 | 0.787 | |
| ae15opi1 | 0.704 | **0.894** |

| Cronbach's α using Sample Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **ae15opi1** | **ae14ope1** | **ae13opa1** | **ae9opbe1** | **ae8opco1** | **ae5oppe1** | **ae4opfo1** | **Cronbach's α** |
| ae15opi1 | 1 | | | | | | | |
| ae14ope1 | 0.584 | 1 | | | | | | |
| ae13opa1 | 0.529 | 0.615 | 1 | | | | | |
| ae9opbe1 | 0.515 | 0.575 | 0.564 | 1 | | | | |
| ae8opco1 | 0.527 | 0.596 | 0.564 | 0.584 | 1 | | | |
| ae5oppe1 | 0.455 | 0.559 | 0.519 | 0.573 | 0.581 | 1 | | |
| ae4opfo1 | 0.52 | 0.495 | 0.514 | 0.482 | 0.494 | 0.479 | 1 | **0.891** |

**Exhibit 5.10: Entrepreneurial Attitude Coefficient H (and Cronbach α) Calculations @ $T_1$ (*Nascent Entrepreneurs*)**

Using the factor score weights from the Entrepreneurial Attitude one factor measurement model analysis, the "rescaled" factor score weights (that sum to 1.00) appear in Exhibit 5.11. The factor score weights are rescaled so that the items that make up the composite are all measured on the same scale; thus, the composite will also have the same scale as its items.

| Details | ae15opi1 | ae14ope1 | ae13opa1 | ae9opbe1 | ae8opco1 | ae5oppe1 | ae4opfo1 | Total |
|---|---|---|---|---|---|---|---|---|
| Factor Score Weights | 0.074 | 0.11 | 0.104 | 0.099 | 0.109 | 0.087 | 0.071 | 0.654 |
| Norm. Factor Weights | **0.113** | **0.168** | **0.159** | **0.151** | **0.167** | **0.133** | **0.109** | 1.000 |

**Exhibit 5.11: Rescaled Factor Score Weightings for Entrepreneurial Attitude @ $T_1$ (*Nascent Entrepreneurs*)**

The rescaled factor score weights are then used to develop a weighted item composite in SPSS so that the standard deviation of this composite can be calculated. This will then be used in calculating the factor loading and error variance of the composite. The standard deviation for the Entrepreneurial Attitude latent variable composite at $T_1$ is 1.44953.

### 3.2.2 Entrepreneurial Attitude Composite @ T2 - *Nascent Entrepreneur Group*

Exhibit 5.12 represents the Nascent Entrepreneur Group one factor measurement model for the Entrepreneurial Attitude latent variable at $T_2$. The standardized regression weights from this model are used in the composite calculations.

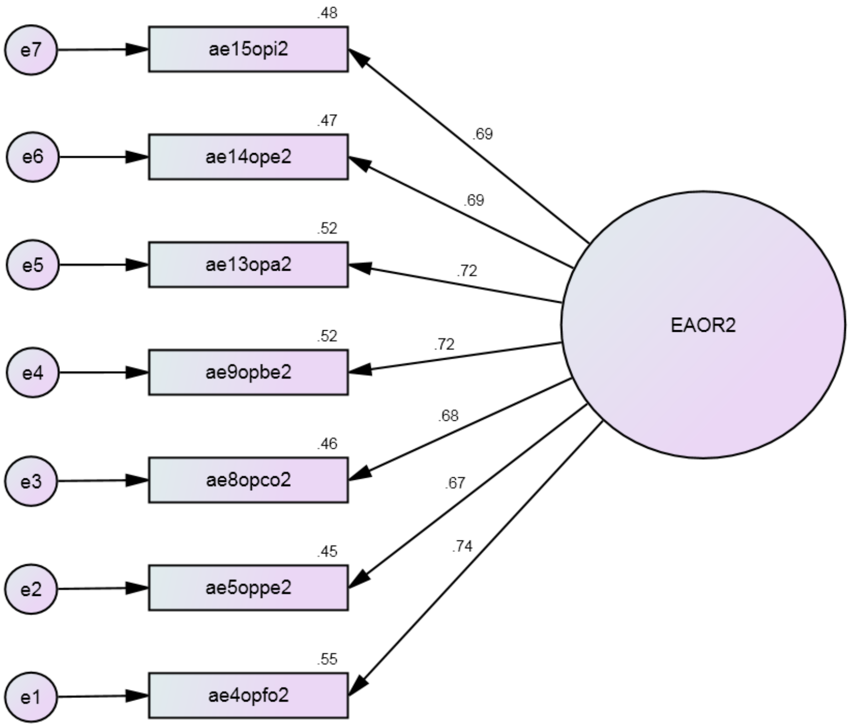



**Exhibit 5.12: Entrepreneurial Attitude One Factor Measurement Model @ $T_2$**
**(*Nascent Entrepreneurs*)**

Exhibit 5.13 presents the worksheet used to calculate the Coefficient H reliability used to calculate the composites for the Nascent Entrepreneur Group at $T_2$. Underneath this appears, *for comparison purposes only*, the Cronbach Alpha reliability which was not used in the calculations because the models were considered “congeneric”. As can be seen, while using the Coefficient H reliability is technically correct for a congeneric model, there is little difference between the Coefficient H (0.873) and Cronbach Alpha (0.871) reliabilities.

| Coefficient H using Standardized Regression Weights | | |
|---|---|---|
| **Variables** | **λ** | **Coefficient H** |
| ae4opfo2 | 0.740 | |
| ae5oppe2 | 0.674 | |
| ae8opco2 | 0.678 | |
| ae9opbe2 | 0.721 | |
| ae13opa2 | 0.723 | |
| ae14ope2 | 0.686 | |
| ae15opi2 | 0.690 | **0.873** |

| Cronbach's α using Sample Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **ae15opi2** | **ae14ope2** | **ae13opa2** | **ae9opbe2** | **ae8opco2** | **ae5oppe2** | **ae4opfo2** | **Cronbach's α** |
| ae15opi2 | 1 | | | | | | | |
| ae14ope2 | 0.507 | 1 | | | | | | |
| ae13opa2 | 0.505 | 0.515 | 1 | | | | | |
| ae9opbe2 | 0.489 | 0.485 | 0.517 | 1 | | | | |
| ae8opco2 | 0.456 | 0.445 | 0.489 | 0.522 | 1 | | | |
| ae5oppe2 | 0.451 | 0.441 | 0.471 | 0.487 | 0.461 | 1 | | |
| ae4opfo2 | 0.503 | 0.503 | 0.53 | 0.524 | 0.494 | 0.536 | 1 | **0.871** |

**Exhibit 5.13: Entrepreneurial Attitude Coefficient H (and Cronbach α) Calculations @ $T_2$**
**(*Nascent Entrepreneurs*)**

Using the factor score weights from the Entrepreneurial Attitude one factor measurement model analysis, the "rescaled" factor score weights (that sum to 1.00) appear in Exhibit 5.14. The factor score weights are rescaled so that the items that make up the composite are all measured on the same scale; thus, the composite will also have the same scale as its items.

| Details | ae15opi2 | ae14ope2 | ae13opa2 | ae9opbe2 | ae8opco2 | ae5oppe2 | ae4opfo2 | Total |
|---|---|---|---|---|---|---|---|---|
| Factor Score Weights | 0.096 | 0.101 | 0.113 | 0.122 | 0.093 | 0.098 | 0.143 | 0.766 |
| Norm. Factor Weights | **0.125** | **0.132** | **0.148** | **0.159** | **0.121** | **0.128** | **0.187** | 1.000 |

**Exhibit 5.14: Rescaled Factor Score Weightings for Entrepreneurial Attitude @ $T_2$**
**(*Nascent Entrepreneurs*)**

The rescaled factor score weights are then used to develop a weighted item composite in SPSS so that the standard deviation of this composite can be calculated. This will then be used in calculating the factor loading and error variance of the composite. The standard deviation for the Entrepreneurial Attitude latent variable composite at $T_2$ is 1.22011.

### 3.2.3 Entrepreneurial Attitude Composite @ T3 - *Nascent Entrepreneur Group*

Exhibit 5.15 represents the Nascent Entrepreneur Group one factor measurement model for the Entrepreneurial Attitude latent variable at $T_3$. The standardized regression weights from this model are used in the composite calculations.

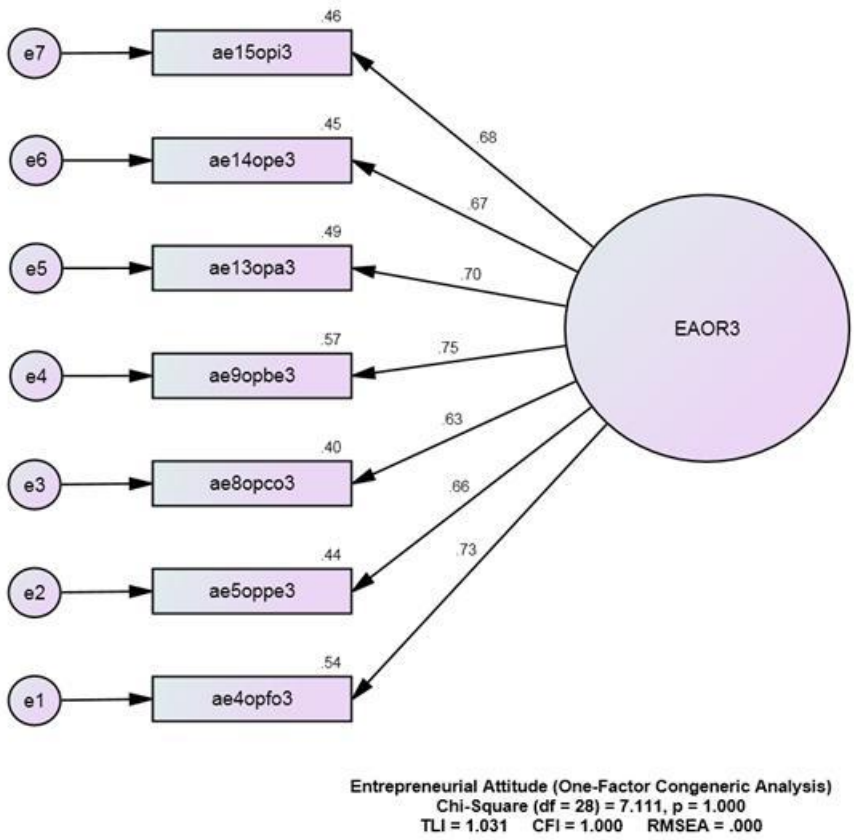



**Exhibit 5.15: Entrepreneurial Attitude One Factor Measurement Model @ $T_3$**
**(*Nascent Entrepreneurs*)**

Exhibit 5.16 presents the worksheet used to calculate the Coefficient H reliability used to calculate the composites for the Nascent Entrepreneur Group at $T_3$. Underneath this appears, *for comparison purposes only*, the Cronbach Alpha reliability which was not used in the calculations because the models were considered “congeneric”. As can be seen, while using the Coefficient H reliability is technically correct for a congeneric model, there is little difference between the Coefficient H (0.867) and Cronbach Alpha (0.864) reliabilities.

| Coefficient H using Standardized Regression Weights | | |
|---|---|---|
| Variables | λ | Coefficient H |
| ae4opfo3 | 0.732 | |
| ae5oppe3 | 0.663 | |
| ae8opco3 | 0.629 | |
| ae9opbe3 | 0.753 | |
| ae13opa3 | 0.702 | |
| ae14ope3 | 0.671 | |
| ae15opi3 | 0.677 | **0.867** |

| Cronbach's α using Sample Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 | Cronbach's α |
| ae15opi3 | 1 | | | | | | | |
| ae14ope3 | 0.48 | 1 | | | | | | |
| ae13opa3 | 0.473 | 0.486 | 1 | | | | | |
| ae9opbe3 | 0.504 | 0.51 | 0.535 | 1 | | | | |
| ae8opco3 | 0.402 | 0.416 | 0.446 | 0.494 | 1 | | | |
| ae5oppe3 | 0.436 | 0.423 | 0.454 | 0.494 | 0.419 | 1 | | |
| ae4opfo3 | 0.509 | 0.473 | 0.502 | 0.538 | 0.456 | 0.527 | 1 | **0.864** |

**Exhibit 5.16: Entrepreneurial Attitude Coefficient H (and Cronbach α) Calculations @ $T_3$ (*Nascent Entrepreneurs*)**

Using the factor score weights from the Entrepreneurial Attitude one factor measurement model analysis, the "rescaled" factor score weights (that sum to 1.00) appear in Exhibit 5.17. The factor score weights are rescaled so that the items that make up the composite are all measured on the same scale; thus, the composite will also have the same scale as its items.

| Details | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 | Total |
|---|---|---|---|---|---|---|---|---|
| Factor Score Weights | 0.100 | 0.090 | 0.114 | 0.152 | 0.078 | 0.098 | 0.144 | 0.776 |
| Norm. Factor Weights | **0.129** | **0.116** | **0.147** | **0.196** | **0.101** | **0.126** | **0.186** | 1.000 |

**Exhibit 5.17: Rescaled Factor Score Weightings for Entrepreneurial Attitude @ $T_3$ (*Nascent Entrepreneurs*)**

The rescaled factor score weights are then used to develop a weighted item composite in SPSS so that the standard deviation of this composite can be calculated. This will then be used in calculating the factor loading and error variance of the composite. The standard deviation for the Entrepreneurial Attitude latent variable composite at $T_3$ is 1.20086.

## 3.3 Entrepreneurial Attitude Composites – *Non-Entrepreneur Group*

This section provides details of how the Entrepreneurial Attitude composites were calculated for the Non-Entrepreneur Group.

### 3.3.1 Entrepreneurial Attitude Composite @ T1 – *Non-Entrepreneur Group*

Exhibit 5.18 represents the Non-Entrepreneur Group one factor measurement model for the Entrepreneurial Attitude latent variable at $T_1$. The standardized regression weights from this model are used in the composite calculations.

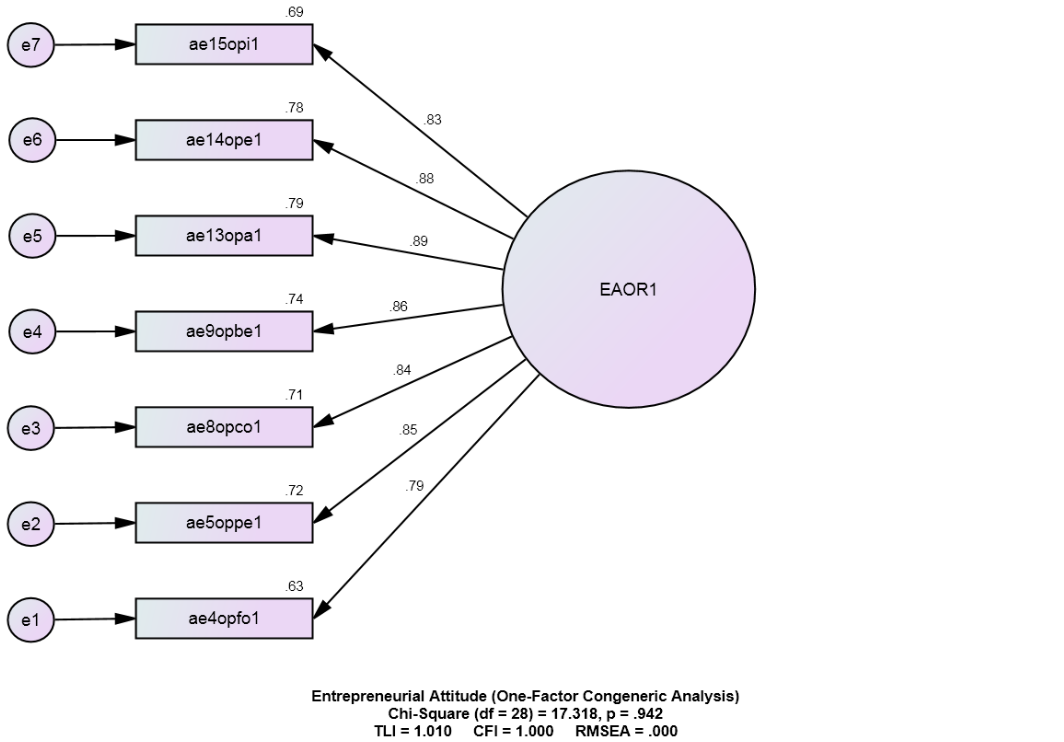



**Exhibit 5.18: Entrepreneurial Attitude One Factor Measurement Model at $T_1$ (*Non-Entrepreneurs*)**

Exhibit 5.19 presents the worksheet used to calculate the Coefficient H reliability used to calculate the composites for the Non-Entrepreneur Group at $T_1$. Underneath this appears, *for comparison purposes only*, the Cronbach Alpha reliability which was not used in the calculations because the models were considered "congeneric". As can be seen, while using the Coefficient H reliability is technically correct for a congeneric model, there is little difference between the Coefficient H (0.950) and Cronbach Alpha (0.947) reliabilities.

| Coefficient H using Standardized Regression Weights | | |
|---|---|---|
| **Variables** | **λ** | **Coefficient H** |
| ae4opfo1 | 0.791 | |
| ae5oppe1 | 0.846 | |
| ae8opco1 | 0.841 | |
| ae9opbe1 | 0.860 | |
| ae13opa1 | 0.887 | |
| ae14ope1 | 0.882 | |
| ae15opi1 | 0.830 | **0.950** |

| Cronbach's α using Sample Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **ae15opi1** | **ae14ope1** | **ae13opa1** | **ae9opbe1** | **ae8opco1** | **ae5oppe1** | **ae4opfo1** | **Cronbach's α** |
| ae15opi1 | 1 | | | | | | | |
| ae14ope1 | 0.735 | 1 | | | | | | |
| ae13opa1 | 0.744 | 0.775 | 1 | | | | | |
| ae9opbe1 | 0.72 | 0.769 | 0.764 | 1 | | | | |
| ae8opco1 | 0.692 | 0.744 | 0.743 | 0.729 | 1 | | | |
| ae5oppe1 | 0.686 | 0.749 | 0.753 | 0.71 | 0.715 | 1 | | |
| ae4opfo1 | 0.656 | 0.686 | 0.704 | 0.668 | 0.662 | 0.7 | 1 | **0.947** |

**Exhibit 5.19: Entrepreneurial Attitude Coefficient H (and Cronbach α) Calculations @ $T_1$ (*Non-Entrepreneurs*)**

Using the factor score weights from the Entrepreneurial Attitude one factor measurement model analysis, the "rescaled" factor score weights (that sum to 1.00) appear in Exhibit 5.20. The factor score weights are rescaled so that the items that make up the composite are all measured on the same scale; thus, the composite will also have the same scale as its items.

| **Details** | **ae15opi1** | **ae14ope1** | **ae13opa1** | **ae9opbe1** | **ae8opco1** | **ae5oppe1** | **ae4opfo1** | **Total** |
|---|---|---|---|---|---|---|---|---|
| Factor Score Weights | 0.069 | 0.103 | 0.116 | 0.086 | 0.079 | 0.079 | 0.053 | 0.585 |
| Norm. Factor Weights | **0.118** | **0.176** | **0.198** | **0.147** | **0.135** | **0.135** | **0.091** | 1.000 |

**Exhibit 5.20: Rescaled Factor Score Weightings for Entrepreneurial Attitude @ $T_1$ (*Non-Entrepreneurs*)**

The rescaled factor score weights are then used to develop a weighted item composite in SPSS so that the standard deviation of this composite can be calculated. This will then be used in calculating the factor loading and error variance of the composite. The standard deviation for the Entrepreneurial Attitude latent variable composite at $T_1$ is 1.67382.

### 3.3.2 Entrepreneurial Attitude Composite @ T2 – *Non-Entrepreneur Group*

Exhibit 5.21 represents the Non-Entrepreneur Group one factor measurement model for the Entrepreneurial Attitude latent variable at $T_2$. The standardized regression weights from this model are used in the composite calculations.

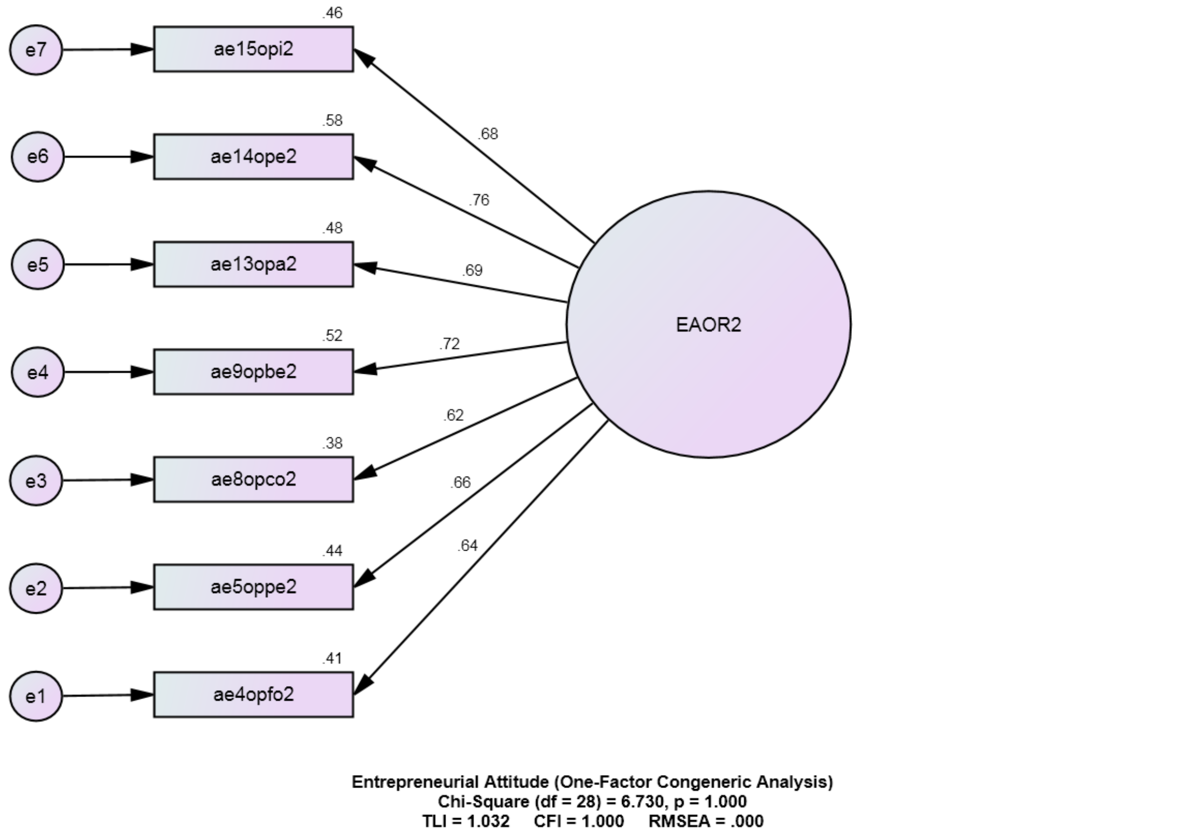



**Exhibit 5.21: Entrepreneurial Attitude One Factor Measurement Model @ $T_2$ (*Non-Entrepreneurs*)**

Exhibit 5.22 presents the worksheet used to calculate the Coefficient H reliability used to calculate the composites for the Nascent Entrepreneur Group at $T_2$. Underneath this appears, *for comparison purposes only*, the Cronbach Alpha reliability which was not used in the calculations because the models were considered "congeneric". As can be seen, while using the Coefficient H reliability is technically correct for a congeneric model, there is little difference between the Coefficient H (0.864) and Cronbach Alpha (0.859) reliabilities.

| Coefficient H using Standardized Regression Weights | | |
|---|---|---|
| **Variables** | **λ** | **Coefficient H** |
| ae4opfo2 | 0.641 | |
| ae5oppe2 | 0.662 | |
| ae8opco2 | 0.620 | |
| ae9opbe2 | 0.720 | |
| ae13opa2 | 0.691 | |
| ae14ope2 | 0.763 | |
| ae15opi2 | 0.678 | **0.864** |

| Cronbach's α using Sample Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **ae15opi2** | **ae14ope2** | **ae13opa2** | **ae9opbe2** | **ae8opco2** | **ae5oppe2** | **ae4opfo2** | **Cronbach's α** |
| ae15opi2 | 1 | | | | | | | |
| ae14ope2 | 0.529 | 1 | | | | | | |
| ae13opa2 | 0.459 | 0.529 | 1 | | | | | |
| ae9opbe2 | 0.486 | 0.557 | 0.497 | 1 | | | | |
| ae8opco2 | 0.412 | 0.458 | 0.441 | 0.448 | 1 | | | |
| ae5oppe2 | 0.446 | 0.506 | 0.459 | 0.464 | 0.417 | 1 | | |
| ae4opfo2 | 0.439 | 0.476 | 0.438 | 0.464 | 0.409 | 0.433 | 1 | **0.859** |

**Exhibit 5.22: Entrepreneurial Attitude Coefficient H (and Cronbach α) Calculations @ $T_2$ (*Non-Entrepreneurs*)**

Using the factor score weights from the Entrepreneurial Attitude one factor measurement model analysis, the "rescaled" factor score weights (that sum to 1.00) appear in Exhibit 5.23. The factor score weights are rescaled so that the items that make up the composite are all measured on the same scale; thus, the composite will also have the same scale as its items.

| Details | ae15opi2 | ae14ope2 | ae13opa2 | ae9opbe2 | ae8opco2 | ae5oppe2 | ae4opfo2 | Total |
|---|---|---|---|---|---|---|---|---|
| Factor Score Weights | 0.088 | 0.123 | 0.111 | 0.114 | 0.074 | 0.081 | 0.088 | 0.679 |
| Norm. Factor Weights | **0.130** | **0.181** | **0.163** | **0.168** | **0.109** | **0.119** | **0.130** | 1.000 |

**Exhibit 5.23: Rescaled Factor Score Weightings for Entrepreneurial Attitude @ $T_2$ (*Non- Entrepreneurs*)**

The rescaled factor score weights are then used to develop a weighted item composite in SPSS so that the standard deviation of this composite can be calculated. This will then be used in calculating the factor loading and error variance of the composite. The standard deviation for the Entrepreneurial Attitude latent variable composite at $T_2$ is 1. 37705.

### 3.3.3 Entrepreneurial Attitude Composite @ T3 – *Non-Entrepreneur Group*

Exhibit 5.24 represents the Non-Entrepreneur Group one factor measurement model for the Entrepreneurial Attitude latent variable at $T_3$. The standardized regression weights from this model are used in the composite calculations.

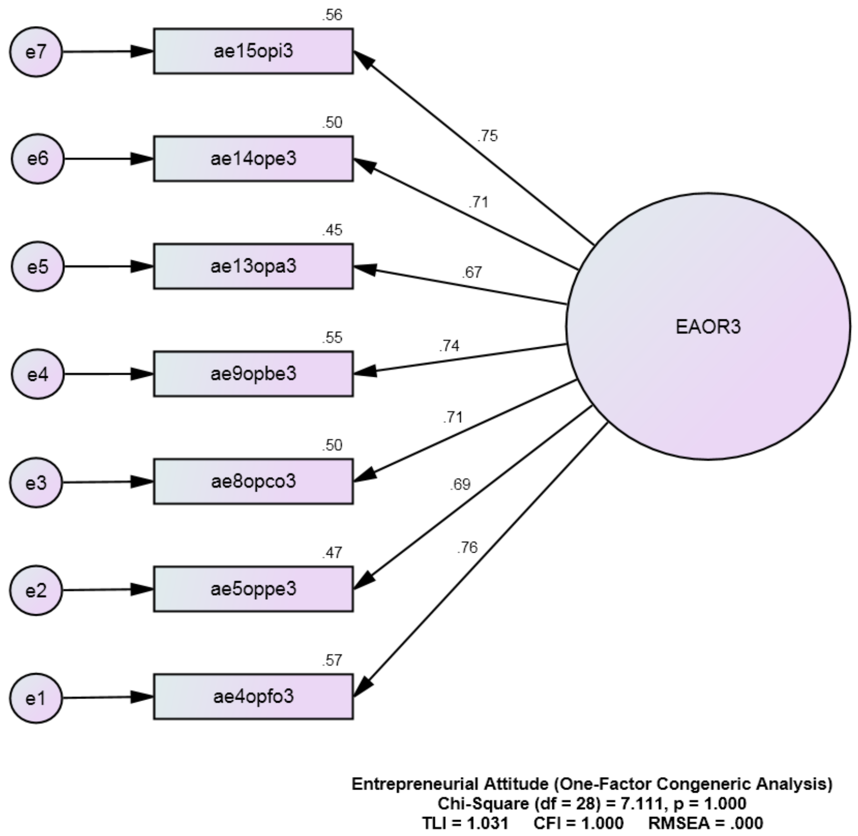



**Exhibit 5.24: Entrepreneurial Attitude One Factor Measurement Model @ $T_3$**
**(*Non-Entrepreneurs*)**

Exhibit 5.25 presents the worksheet used to calculate the Coefficient H reliability used to calculate the composites for the Non-Entrepreneur Group at $T_3$. Underneath this appears, *for comparison purposes only*, the Cronbach Alpha reliability which was not used in the calculations because the models were considered "congeneric". As can be seen, while using the Coefficient H reliability is technically correct for a congeneric model, there is little difference between the Coefficient H (0.883) and Cronbach Alpha (0.881) reliabilities.

| Coefficient H using Standardized Regression Weights | | |
|---|---|---|
| Variables | λ | Coefficient H |
| ae4opfo3 | 0.758 | |
| ae5oppe3 | 0.687 | |
| ae8opco3 | 0.71 | |
| ae9opbe3 | 0.743 | |
| ae13opa3 | 0.669 | |
| ae14ope3 | 0.708 | |
| ae15opi3 | 0.746 | **0.883** |

| Cronbach's α using Sample Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 | Cronbach's α |
| ae15opi3 | 1 | | | | | | | |
| ae14ope3 | 0.547 | 1 | | | | | | |
| ae13opa3 | 0.475 | 0.49 | 1 | | | | | |
| ae9opbe3 | 0.556 | 0.515 | 0.509 | 1 | | | | |
| ae8opco3 | 0.528 | 0.503 | 0.487 | 0.515 | 1 | | | |
| ae5oppe3 | 0.497 | 0.474 | 0.478 | 0.517 | 0.485 | 1 | | |
| ae4opfo3 | 0.577 | 0.525 | 0.481 | 0.567 | 0.546 | 0.529 | 1 | **0.881** |

**Exhibit 5.25: Entrepreneurial Attitude Coefficient H (and Cronbach α) Calculations @ $T_3$ (*Non-Entrepreneurs*)**

Using the factor score weights from the Entrepreneurial Attitude one factor measurement model analysis, the "rescaled" factor score weights (that sum to 1.00) appear in Exhibit 5.26. The factor score weights are rescaled so that the items that make up the composite are all measured on the same scale; thus, the composite will also have the same scale as its items.

| Details | ae15opi3 | ae14ope3 | ae13opa3 | ae9opbe3 | ae8opco3 | ae5oppe3 | ae4opfo3 | Total |
|---|---|---|---|---|---|---|---|---|
| Factor Score Weights | 0.100 | 0.090 | 0.075 | 0.104 | 0.082 | 0.081 | 0.107 | 0.639 |
| Norm. Factor Weights | **0.156** | **0.141** | **0.117** | **0.163** | **0.128** | **0.127** | **0.167** | 1.000 |

**Exhibit 5.26: Rescaled Factor Score Weightings for Entrepreneurial Attitude @ $T_3$ (*Non-Entrepreneurs*)**

The rescaled factor score weights are then used to develop a weighted item composite in SPSS so that the standard deviation of this composite can be calculated. This will then be used in calculating the factor loading and error variance of the composite. The standard deviation for the Entrepreneurial Attitude latent variable composite at $T_3$ is 1.4774.

## 3.4 Refined Full Composite Models

Based on the calculations above, the following sections present the refined full composite models for the Nascent Entrepreneur and Non-Entrepreneur Groups. Exhibit 5.27 presents the model fit statistics for the composite model.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 102.885with 160 df and p = 1.000 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0217 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.021 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 5.27: Model Fit Statistics for the Full Structural Model**
**(*Both Groups*)**

### 3.4.1 Refined Full Composite Model - *Nascent Entrepreneur Group*

Exhibit 5.28 presents the Factor Loadings and Error Variances that are used in the Entrepreneurial Attitude composites at $T_1$, $T_2$, and $T_3$. These were derived from the calculations reported in the previous section.

| Name of Latent Variable | Stdev of Composite ($s_x$) | Reliability of Composite ($r_x$) | Factor Loading ($\lambda$) = ($s_x$*$\sqrt{r_x}$) | Error Variance ($\theta$) = ($s_x^2$ [1-$r_x$]) |
|---|---|---|---|---|
| EAOR1 - Nascent Entrepreneur | 1.4495 | 0.8940 | 1.3706 | 0.2227 |
| EAOR2 - Nascent Entrepreneur | 1.2201 | 0.8730 | 1.1400 | 0.1891 |
| EAOR3 - Nascent Entrepreneur | 1.2009 | 0.8670 | 1.1182 | 0.1918 |

**Exhibit 5.28: Factor Loadings and Error Variances for $T_1$, $T_2$, & $T_3$**
**Entrepreneurial Attitude Composite Calculations**
**(*Nascent Entrepreneurs*)**

Using these factor loadings and error variances, Exhibit 5.29 presents the full structural model for the Nascent Entrepreneur Group with the individual Entrepreneurial Attitude items replaced with a composite for each Entrepreneurial Attitude latent variable. The factor loadings and error variances have been manually inserted into the model for the composite variables and their error terms.

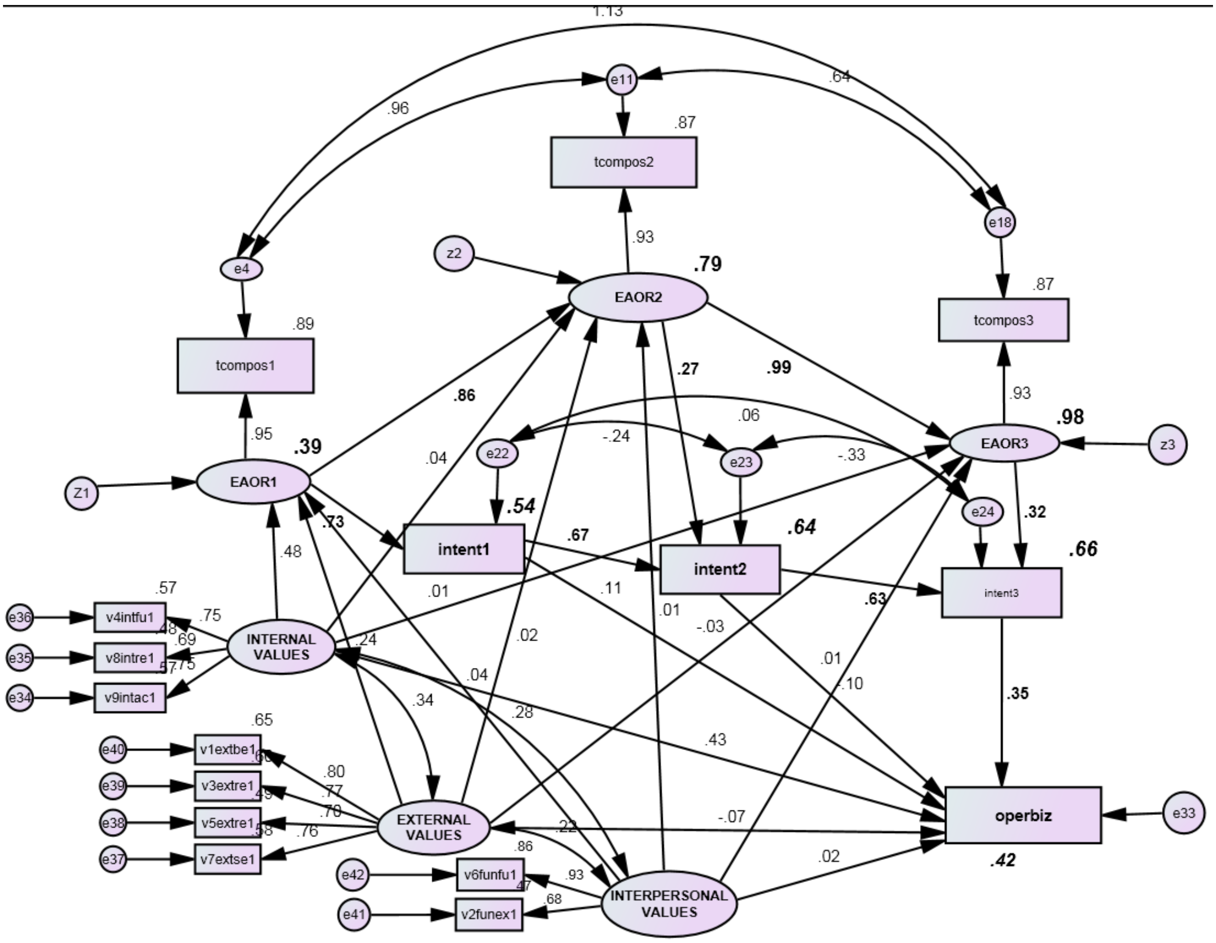



**Exhibit 5.29: Full Structural Model using Entrepreneurial Attitude Composites at $T_1$, $T_2$, & $T_3$ (*Nascent Entrepreneurs*)**

Exhibit 5.30 reports the regression weights, standardized regression weights, and squared multiple correlations for the Nascent Entrepreneur Group. Of note is that 42% of the Business Start-Up Behaviour (operbiz) variance is explained in the model.

***Regression Weights: (1 Nascent Entrepreneurs - Default)***

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .350 | .052 | 6.702 | *** | par_15 |
| EAOR1 | <--- | EXTERNAL_VALUES | .190 | .051 | 3.739 | *** | par_29 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | .038 | .053 | .721 | .471 | par_33 |
| intent1 | <--- | EAOR1 | .621 | .039 | 16.100 | *** | par_4 |
| EAOR2 | <--- | EAOR1 | .853 | .054 | 15.828 | *** | par_7 |
| EAOR2 | <--- | EXTERNAL_VALUES | .014 | .028 | .502 | .616 | par_26 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | .008 | .028 | .283 | .778 | par_28 |
| EAOR2 | <--- | INTERNAL_VALUES | .031 | .033 | .953 | .341 | par_30 |
| EAOR3 | <--- | EAOR2 | .997 | .041 | 24.128 | *** | par_6 |
| intent2 | <--- | EAOR2 | .233 | .068 | 3.442 | *** | par_14 |
| intent2 | <--- | intent1 | .678 | .110 | 6.146 | *** | par_19 |
| EAOR3 | <--- | INTERNAL_VALUES | .007 | .025 | .281 | .779 | par_27 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | .012 | .021 | .558 | .577 | par_31 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.027 | .022 | -1.277 | .202 | par_32 |
| intent3 | <--- | EAOR3 | .276 | .099 | 2.792 | .005 | par_5 |

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| intent3 | <--- | intent2 | .644 | .157 | 4.111 | *** | par_18 |
| tcompos1 | <--- | EAOR1 | 1.371 | | | | |
| tcompos3 | <--- | EAOR3 | 1.118 | | | | |
| tcompos2 | <--- | EAOR2 | 1.140 | | | | |
| v9intac1 | <--- | INTERNAL_VALUES | 1.000 | | | | |
| v8intre1 | <--- | INTERNAL_VALUES | .854 | .083 | 10.250 | *** | par_8 |
| v4intfu1 | <--- | INTERNAL_VALUES | .956 | .088 | 10.922 | *** | par_9 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.000 | | | | |
| v5extre1 | <--- | EXTERNAL_VALUES | .911 | .081 | 11.256 | *** | par_10 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.058 | .085 | 12.377 | *** | par_11 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.141 | .089 | 12.785 | *** | par_12 |
| operbiz | <--- | EXTERNAL_VALUES | -.072 | .062 | -1.156 | .248 | par_13 |
| operbiz | <--- | intent3 | .542 | .119 | 4.553 | *** | par_16 |
| operbiz | <--- | intent2 | -.163 | .129 | -1.260 | .208 | par_17 |
| operbiz | <--- | intent1 | .169 | .120 | 1.407 | .159 | par_20 |
| operbiz | <--- | INTERNAL_VALUES | .420 | .070 | 6.011 | *** | par_21 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.000 | | | | |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | 1.363 | .309 | 4.417 | *** | par_23 |
| operbiz | <--- | INTERPERSONAL_VALUES | .029 | .064 | .452 | .652 | par_37 |

**Standardized Regression Weights: (1 Nascent Entrepreneurs - Default)**

| | | | Estimate |
|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .484 |
| EAOR1 | <--- | EXTERNAL_VALUES | .238 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | .043 |
| intent1 | <--- | EAOR1 | .733 |
| EAOR2 | <--- | EAOR1 | .855 |
| EAOR2 | <--- | EXTERNAL_VALUES | .018 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | .009 |
| EAOR2 | <--- | INTERNAL_VALUES | .044 |
| EAOR3 | <--- | EAOR2 | .994 |
| intent2 | <--- | EAOR2 | .273 |
| intent2 | <--- | intent1 | .674 |
| EAOR3 | <--- | INTERNAL_VALUES | .010 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | .013 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.034 |
| intent3 | <--- | EAOR3 | .319 |
| intent3 | <--- | intent2 | .633 |
| tcompos1 | <--- | EAOR1 | .945 |
| tcompos3 | <--- | EAOR3 | .931 |
| tcompos2 | <--- | EAOR2 | .934 |
| v9intac1 | <--- | INTERNAL_VALUES | .753 |
| v8intre1 | <--- | INTERNAL_VALUES | .690 |
| v4intfu1 | <--- | INTERNAL_VALUES | .754 |
| v7extse1 | <--- | EXTERNAL_VALUES | .759 |
| v5extre1 | <--- | EXTERNAL_VALUES | .702 |
| v3extre1 | <--- | EXTERNAL_VALUES | .774 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .805 |
| operbiz | <--- | EXTERNAL_VALUES | -.066 |
| operbiz | <--- | intent3 | .347 |
| operbiz | <--- | intent2 | -.102 |
| operbiz | <--- | intent1 | .106 |
| operbiz | <--- | INTERNAL_VALUES | .428 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .685 |

| | | | Estimate |
|---|---|---|---|
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .928 |
| operbiz | <--- | INTERPERSONAL_VALUES | .024 |

**Squared Multiple Correlations: (1 Nascent Entrepreneurs - Default)**

| | Estimate |
|---|---|
| EAOR1 | .388 |
| intent1 | .537 |
| EAOR2 | .794 |
| intent2 | .636 |
| EAOR3 | .978 |
| intent3 | .656 |
| v6funfu1 | .861 |
| v2funex1 | .469 |
| **operbiz** | **.420** |
| v1extbe1 | .648 |
| v3extre1 | .599 |
| v5extre1 | .493 |
| v7extse1 | .576 |
| v4intfu1 | .569 |
| v8intre1 | .477 |
| v9intac1 | .567 |
| tcompos2 | .872 |
| tcompos3 | .867 |
| tcompos1 | .894 |

**Exhibit 5.30: Regression Weights, Standardized Regression Weights, & Squared Multiple Correlations (*Nascent Entrepreneurs*)**

Exhibit 5.31 identifies those variable relationships that are not significant. Since there are no Interpersonal Values relationships that are significant for the Nascent Entrepreneur Group, this variable should be dropped from the model.

| | | |
|---|---|---|
| EAOR1 | <--- | INTERPERSONAL_VALUES |
| EAOR2 | <--- | EXTERNAL_VALUES |
| EAOR2 | <--- | INTERPERSONAL_VALUES |
| EAOR2 | <--- | INTERNAL_VALUES |
| EAOR3 | <--- | INTERNAL_VALUES |
| EAOR3 | <--- | INTERPERSONAL_VALUES |
| EAOR3 | <--- | EXTERNAL_VALUES |
| operbiz | <--- | EXTERNAL_VALUES |
| operbiz | <--- | intent2 |
| operbiz | <--- | intent1 |
| operbiz | <--- | INTERPERSONAL_VALUES |

**Exhibit 5.31: Non-Significant Relationships Identified (*Nascent Entrepreneurs*)**

### 3.4.2 Refined Full Composite Model – *Non-Entrepreneur Group*

Exhibit 5.32 presents the Factor Loadings and Error Variances that will be used in the Entrepreneurial Attitude composites at $T_1$, $T_2$, and $T_3$. These were derived from the calculations reported in the previous section.

| Name of Latent Variable | Stdev of Composite ($s_x$) | Reliability of Composite ($r_x$) | Factor Loading ($\lambda$) = ($s_x$*$\sqrt{r_x}$) | Error Variance ($\theta$) = ($s_x^2$ [1-$r_x$]) |
|---|---|---|---|---|
| EAOR1 - Non-Entrepreneur | 1.6738 | 0.9500 | 1.6314 | 0.1401 |
| EAOR2 - Non-Entrepreneur | 1.3771 | 0.8640 | 1.2800 | 0.2579 |
| EAOR3 - Non-Entrepreneur | 1.4774 | 0.8830 | 1.3883 | 0.2554 |

**Exhibit 5.32: Factor Loadings & Error Variances for $T_1$, $T_2$, & $T_3$ Entrepreneurial Attitude Composite Calculations (*Non-Entrepreneurs*)**

Using these factor loadings and error variances, Exhibit 5.33 presents the full structural model for the Non-Entrepreneur Group with the individual Entrepreneurial Attitude items replaced with a composite for each Entrepreneurial Attitude latent variable. The factor loadings and error variances have been manually inserted into the model for the composite variables and their error terms.

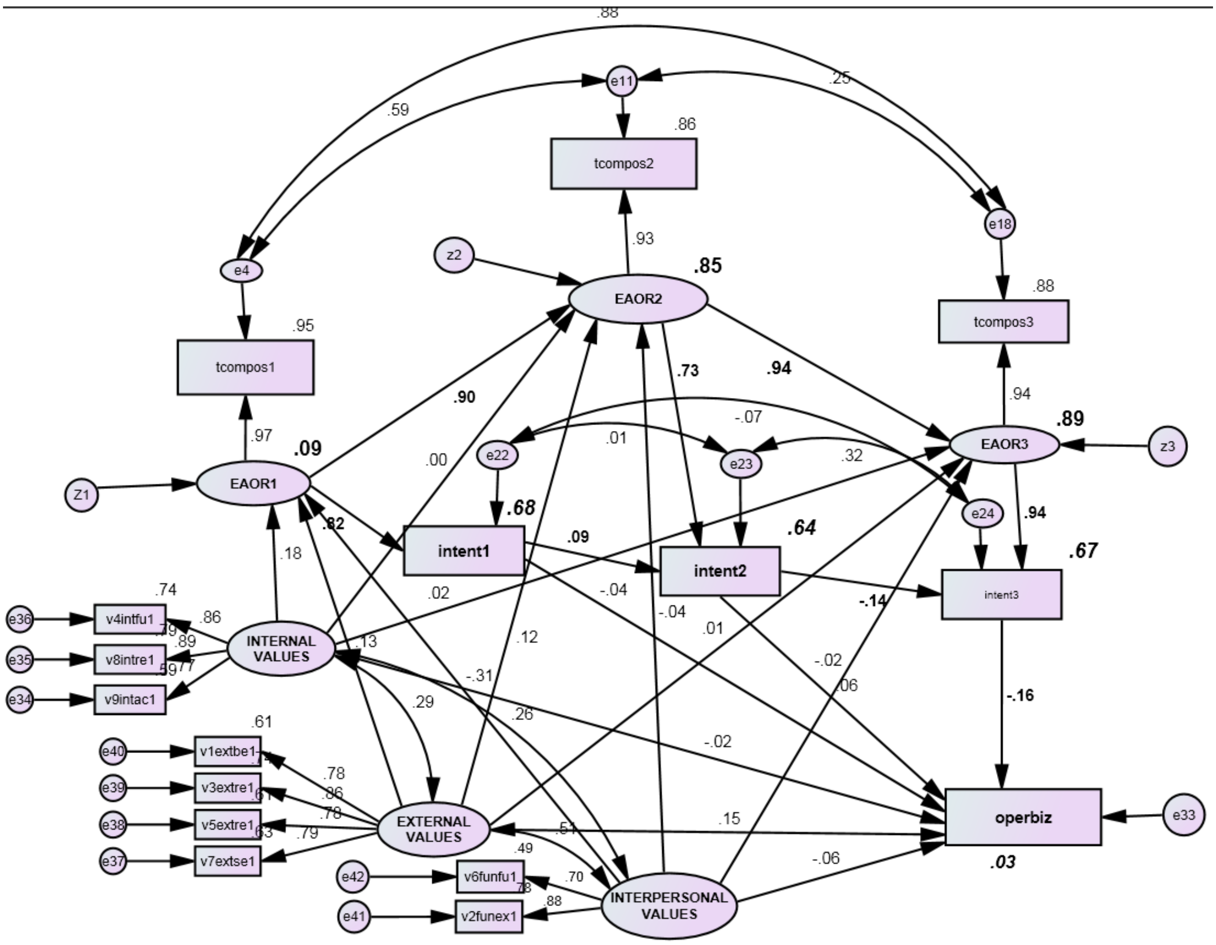



**Exhibit 5.33: Full Structural Model using Entrepreneurial Attitude Composites at $T_1$, $T_2$, & $T_3$ (*Non-Entrepreneurs*)**

Exhibit 5.34 reports the regression weights, standardized regression weights, and squared multiple correlations for the Non-Entrepreneur Group. Of note is that only 3% of the Business Start-Up Behaviour (operbiz) variance is explained in the model.

**Regression Weights: (2 Non-Entrepreneurs - Default)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .121 | .073 | 1.651 | .099 | par_52 |
| EAOR1 | <--- | EXTERNAL_VALUES | .096 | .097 | .984 | .325 | par_66 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | -.188 | .088 | -2.124 | .034 | par_70 |
| intent1 | <--- | EAOR1 | .626 | .046 | 13.742 | *** | par_41 |
| EAOR2 | <--- | EAOR1 | .903 | .058 | 15.448 | *** | par_44 |
| EAOR2 | <--- | EXTERNAL_VALUES | .091 | .048 | 1.891 | .059 | par_63 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | -.026 | .042 | -.607 | .544 | par_65 |
| EAOR2 | <--- | INTERNAL_VALUES | .002 | .036 | .058 | .953 | par_67 |
| EAOR3 | <--- | EAOR2 | .936 | .067 | 13.938 | *** | par_43 |
| intent2 | <--- | EAOR2 | .415 | .110 | 3.755 | *** | par_51 |
| intent2 | <--- | intent1 | .065 | .173 | .375 | .708 | par_56 |
| EAOR3 | <--- | INTERNAL_VALUES | .011 | .039 | .286 | .775 | par_64 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | -.015 | .045 | -.335 | .738 | par_68 |
| EAOR3 | <--- | EXTERNAL_VALUES | .007 | .052 | .129 | .897 | par_69 |
| intent3 | <--- | EAOR3 | .687 | .295 | 2.328 | .020 | par_42 |
| intent3 | <--- | intent2 | -.183 | .663 | -.276 | .782 | par_55 |
| tcompos1 | <--- | EAOR1 | 1.631 | | | | |
| tcompos3 | <--- | EAOR3 | 1.388 | | | | |
| tcompos2 | <--- | EAOR2 | 1.280 | | | | |
| v9intac1 | <--- | INTERNAL_VALUES | 1.000 | | | | |
| v8intre1 | <--- | INTERNAL_VALUES | 1.153 | .127 | 9.107 | *** | par_45 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.071 | .119 | 8.993 | *** | par_46 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.000 | | | | |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.189 | .143 | 8.345 | *** | par_47 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.151 | .124 | 9.275 | *** | par_48 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.041 | .125 | 8.346 | *** | par_49 |
| operbiz | <--- | EXTERNAL_VALUES | .088 | .077 | 1.154 | .248 | par_50 |
| operbiz | <--- | intent3 | -.168 | .142 | -1.182 | .237 | par_53 |
| operbiz | <--- | intent2 | .083 | .199 | .418 | .676 | par_54 |
| operbiz | <--- | intent1 | -.037 | .133 | -.280 | .780 | par_57 |
| operbiz | <--- | INTERNAL_VALUES | -.012 | .058 | -.210 | .834 | par_58 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | 1.000 | | | | |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .780 | .160 | 4.886 | *** | par_60 |
| operbiz | <--- | INTERPERSONAL_VALUES | -.028 | .066 | -.420 | .675 | par_74 |

**Standardized Regression Weights: (2 Non-Entrepreneurs - Default)**

| | | | Estimate |
|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .182 |
| EAOR1 | <--- | EXTERNAL_VALUES | .128 |
| EAOR1 | <--- | INTERPERSONAL_VALUES | -.305 |
| intent1 | <--- | EAOR1 | .823 |
| EAOR2 | <--- | EAOR1 | .904 |
| EAOR2 | <--- | EXTERNAL_VALUES | .122 |
| EAOR2 | <--- | INTERPERSONAL_VALUES | -.042 |
| EAOR2 | <--- | INTERNAL_VALUES | .003 |
| EAOR3 | <--- | EAOR2 | .935 |
| intent2 | <--- | EAOR2 | .731 |
| intent2 | <--- | intent1 | .087 |
| EAOR3 | <--- | INTERNAL_VALUES | .017 |
| EAOR3 | <--- | INTERPERSONAL_VALUES | -.025 |
| EAOR3 | <--- | EXTERNAL_VALUES | .009 |
| intent3 | <--- | EAOR3 | .935 |
| intent3 | <--- | intent2 | -.142 |

| | | | Estimate |
|---|---|---|---|
| tcompos1 | <--- | EAOR1 | .974 |
| tcompos3 | <--- | EAOR3 | .939 |
| tcompos2 | <--- | EAOR2 | .929 |
| v9intac1 | <--- | INTERNAL_VALUES | .770 |
| v8intre1 | <--- | INTERNAL_VALUES | .887 |
| v4intfu1 | <--- | INTERNAL_VALUES | .861 |
| v7extse1 | <--- | EXTERNAL_VALUES | .791 |
| v5extre1 | <--- | EXTERNAL_VALUES | .778 |
| v3extre1 | <--- | EXTERNAL_VALUES | .858 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .778 |
| operbiz | <--- | EXTERNAL_VALUES | .151 |
| operbiz | <--- | intent3 | -.158 |
| operbiz | <--- | intent2 | .060 |
| operbiz | <--- | intent1 | -.036 |
| operbiz | <--- | INTERNAL_VALUES | -.023 |
| v2funex1 | <--- | INTERPERSONAL_VALUES | .884 |
| v6funfu1 | <--- | INTERPERSONAL_VALUES | .699 |
| operbiz | <--- | INTERPERSONAL_VALUES | -.058 |

**Squared Multiple Correlations: (2 Non-Entrepreneurs - Default)**

| | Estimate |
|---|---|
| EAOR1 | .087 |
| intent1 | .678 |
| EAOR2 | .849 |
| intent2 | .638 |
| EAOR3 | .889 |
| intent3 | .665 |
| v6funfu1 | .488 |
| v2funex1 | .781 |
| operbiz | .033 |
| v1extbe1 | .605 |
| v3extre1 | .736 |
| v5extre1 | .605 |
| v7extse1 | .626 |
| v4intfu1 | .741 |
| v8intre1 | .786 |
| v9intac1 | .594 |
| tcompos2 | .863 |
| tcompos3 | .882 |
| tcompos1 | .949 |

**Exhibit 5.34: Regression Weights, Standardized Regression Weights, & Squared Multiple Correlations (*Non-Entrepreneurs*)**

Exhibit 5.35 identifies those variable relationships that are not significant. Although there is an Interpersonal Values-Entrepreneurial Attitude relationship at $T_1$ (which was negative suggesting that having an Entrepreneurial Attitude toward starting a business is the antithesis of fun and excitement), Interpersonal Values were not related to any other variable. Since the focus of the research is on entrepreneurs, the Interpersonal Values variable should be dropped from the model to make it more parsimonious.

| | | |
|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES |
| EAOR1 | <--- | EXTERNAL_VALUES |
| EAOR2 | <--- | EXTERNAL_VALUES |
| EAOR2 | <--- | INTERPERSONAL_VALUES |
| EAOR2 | <--- | INTERNAL_VALUES |
| intent2 | <--- | intent1 |
| EAOR3 | <--- | INTERNAL_VALUES |
| EAOR3 | <--- | INTERPERSONAL_VALUES |
| EAOR3 | <--- | EXTERNAL_VALUES |
| intent3 | <--- | intent2 |
| operbiz | <--- | EXTERNAL_VALUES |
| operbiz | <--- | intent3 |
| operbiz | <--- | intent2 |
| operbiz | <--- | intent1 |
| operbiz | <--- | INTERNAL_VALUES |
| operbiz | <--- | INTERPERSONAL_VALUES |

**Exhibit 5.35: Non-Significant Relationships Identified (*Non-Entrepreneurs*)**

### 3.5 Composite or Non-Composite Full Structural Model?

Both the composite and non-composite full structural models produced similar results. The $R^2$ for the ultimate dependent variable, Business Start-Up Behaviour, was the same in each case (0.42 for the Nascent Entrepreneur Group and 0.03 for the Non-Entrepreneur Group) with some similarity (though not identical) in the standardized regression weights and significance of those regression weights. From an interpretation perspective, although composite models can be used with smaller sample sizes to produce more stable results, in this research, result stability does not appear to be an issue. The parameter estimates are similar for both structural models. The repeated measures nature of the research design with three panels of data collected provide some support for this. Invariance testing which was conducted on the one factor (non-composite) measurement models demonstrated equality of the groups over time and between groups at each point in time. As such, although either model could be selected, the non-composite model provides a richer source of data since the Entrepreneurial Attitude latent variable is non-aggregated. Thus, the non-composite full structural model is selected for interpretation in this research. This provides the basis for the discussion of the results in Chapter 6 and for the tests of a moderating hypothesis in the next section.

Exhibits 5.36 and 5.37 present the full structural models for the Nascent Entrepreneur Group and the Non-Entrepreneur Group respectively with, based on prior discussion, Interpersonal Values removed since the variable contributed little to the full structural model variance. Of note is that even with Interpersonal Values removed, the $R^2$ for Business Start-Up Behaviour did not change from where these values were when Interpersonal Values were included ($R^2$ = 0.42 and $R^2$ = 0.03 for the Nascent and Non-Entrepreneur Groups respectively). Thus, there is justification for removing this variable from the model.

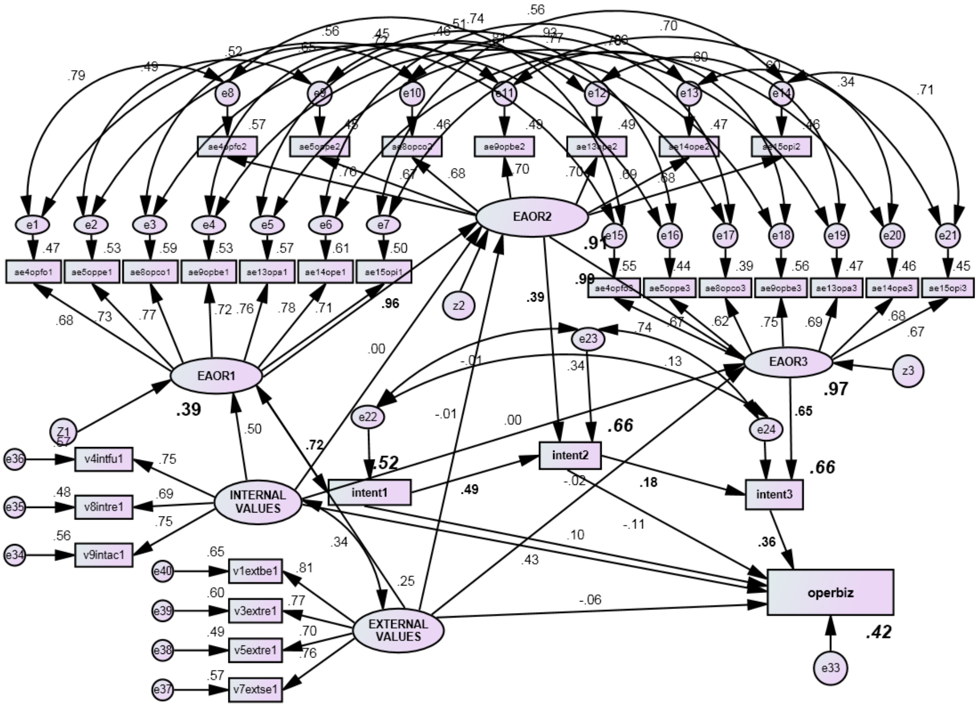



**Exhibit 5.36: Non-Composite Full Structural Model with Interpersonal Values Removed (*Nascent Entrepreneurs*)**

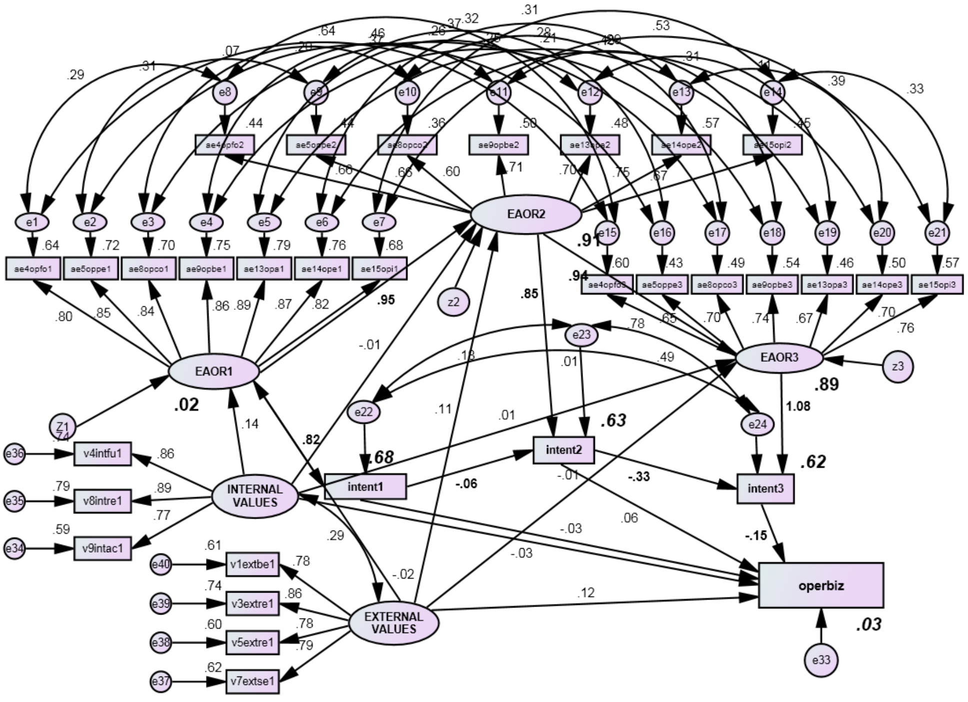



**Exhibit 5.37: Non-Composite Full Structural Model with Interpersonal Values Removed (*Non-Entrepreneurs*)**

Exhibit 5.38 presents the regression weights, standardized regression weights, and squared multiple correlations for the Non-Composite Full Structural Model with Interpersonal Values removed for the Nascent Entrepreneur Group.

**Regression Weights: (1 Nascent Entrepreneurs - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .439 | .068 | 6.463 | *** | par_51 |
| EAOR1 | <--- | EXTERNAL_VALUES | .241 | .063 | 3.810 | *** | par_56 |
| EAOR2 | <--- | EXTERNAL_VALUES | -.005 | .026 | -.194 | .846 | par_59 |
| EAOR2 | <--- | INTERNAL_VALUES | -.003 | .028 | -.099 | .921 | par_62 |
| intent1 | <--- | EAOR1 | .506 | .044 | 11.433 | *** | par_63 |
| EAOR2 | <--- | EAOR1 | .869 | .045 | 19.427 | *** | par_65 |
| intent2 | <--- | intent1 | .496 | .218 | 2.278 | .023 | par_40 |
| EAOR3 | <--- | INTERNAL_VALUES | .003 | .020 | .148 | .883 | par_58 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.021 | .019 | -1.120 | .263 | par_60 |
| intent2 | <--- | EAOR2 | .306 | .123 | 2.493 | .013 | par_61 |
| EAOR3 | <--- | EAOR2 | .976 | .043 | 22.490 | *** | par_66 |
| intent3 | <--- | intent2 | .184 | .288 | .638 | .523 | par_41 |
| intent3 | <--- | EAOR3 | .521 | .172 | 3.038 | .002 | par_42 |
| ae4opfo1 | <--- | EAOR1 | 1.000 | | | | |
| ae5oppe1 | <--- | EAOR1 | 1.090 | .094 | 11.581 | *** | par_1 |
| ae8opco1 | <--- | EAOR1 | 1.145 | .094 | 12.147 | *** | par_2 |
| ae9opbe1 | <--- | EAOR1 | 1.072 | .091 | 11.841 | *** | par_3 |
| ae13opa1 | <--- | EAOR1 | 1.106 | .090 | 12.286 | *** | par_4 |
| ae14ope1 | <--- | EAOR1 | 1.271 | .102 | 12.504 | *** | par_5 |
| ae9opbe3 | <--- | EAOR3 | 1.033 | .079 | 13.063 | *** | par_6 |
| ae13opa3 | <--- | EAOR3 | 1.015 | .085 | 11.940 | *** | par_7 |
| ae14ope3 | <--- | EAOR3 | 1.132 | .097 | 11.663 | *** | par_8 |
| ae15opi3 | <--- | EAOR3 | 1.036 | .089 | 11.625 | *** | par_9 |
| ae5oppe2 | <--- | EAOR2 | .986 | .084 | 11.741 | *** | par_11 |
| ae8opco2 | <--- | EAOR2 | 1.069 | .090 | 11.914 | *** | par_12 |
| ae9opbe2 | <--- | EAOR2 | .989 | .079 | 12.478 | *** | par_13 |
| ae13opa2 | <--- | EAOR2 | 1.077 | .086 | 12.482 | *** | par_14 |
| ae14ope2 | <--- | EAOR2 | 1.023 | .085 | 12.010 | *** | par_15 |
| ae15opi2 | <--- | EAOR2 | 1.073 | .090 | 11.867 | *** | par_16 |
| ae4opfo2 | <--- | EAOR2 | 1.000 | | | | |
| ae8opco3 | <--- | EAOR3 | 1.020 | .096 | 10.591 | *** | par_37 |
| ae5oppe3 | <--- | EAOR3 | .990 | .087 | 11.360 | *** | par_38 |
| ae4opfo3 | <--- | EAOR3 | 1.000 | | | | |
| operbiz | <--- | intent3 | .555 | .119 | 4.664 | *** | par_43 |
| operbiz | <--- | intent2 | -.171 | .129 | -1.322 | .186 | par_44 |
| operbiz | <--- | intent1 | .167 | .122 | 1.364 | .172 | par_45 |

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v9intac1 | <--- | INTERNAL_VALUES | 1.000 | | | | |
| v8intre1 | <--- | INTERNAL_VALUES | .865 | .085 | 10.236 | *** | par_46 |
| v4intfu1 | <--- | INTERNAL_VALUES | .963 | .089 | 10.840 | *** | par_47 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.000 | | | | |
| v5extre1 | <--- | EXTERNAL_VALUES | .913 | .081 | 11.245 | *** | par_48 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.059 | .086 | 12.347 | *** | par_49 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.144 | .090 | 12.764 | *** | par_50 |
| operbiz | <--- | INTERNAL_VALUES | .428 | .069 | 6.233 | *** | par_52 |
| ae15opi1 | <--- | EAOR1 | 1.166 | .102 | 11.453 | *** | par_57 |
| operbiz | <--- | EXTERNAL_VALUES | -.069 | .062 | -1.112 | .266 | par_64 |

**Standardized Regression Weights: (1 Nascent Entrepreneurs - Default model)**

| | | | Estimate |
|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .497 |
| EAOR1 | <--- | EXTERNAL_VALUES | .249 |
| EAOR2 | <--- | EXTERNAL_VALUES | -.006 |
| EAOR2 | <--- | INTERNAL_VALUES | -.003 |
| intent1 | <--- | EAOR1 | .724 |
| EAOR2 | <--- | EAOR1 | .960 |
| intent2 | <--- | intent1 | .491 |
| EAOR3 | <--- | INTERNAL_VALUES | .004 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.024 |
| intent2 | <--- | EAOR2 | .393 |
| EAOR3 | <--- | EAOR2 | .993 |
| intent3 | <--- | intent2 | .180 |
| intent3 | <--- | EAOR3 | .645 |
| ae4opfo1 | <--- | EAOR1 | .685 |
| ae5oppe1 | <--- | EAOR1 | .728 |
| ae8opco1 | <--- | EAOR1 | .765 |
| ae9opbe1 | <--- | EAOR1 | .725 |
| ae13opa1 | <--- | EAOR1 | .756 |
| ae14ope1 | <--- | EAOR1 | .778 |
| ae9opbe3 | <--- | EAOR3 | .746 |
| ae13opa3 | <--- | EAOR3 | .687 |
| ae14ope3 | <--- | EAOR3 | .677 |
| ae15opi3 | <--- | EAOR3 | .674 |
| ae5oppe2 | <--- | EAOR2 | .670 |
| ae8opco2 | <--- | EAOR2 | .680 |
| ae9opbe2 | <--- | EAOR2 | .703 |
| ae13opa2 | <--- | EAOR2 | .701 |
| ae14ope2 | <--- | EAOR2 | .687 |
| ae15opi2 | <--- | EAOR2 | .676 |
| ae4opfo2 | <--- | EAOR2 | .757 |
| ae8opco3 | <--- | EAOR3 | .625 |
| ae5oppe3 | <--- | EAOR3 | .666 |
| ae4opfo3 | <--- | EAOR3 | .743 |
| operbiz | <--- | intent3 | .358 |
| operbiz | <--- | intent2 | -.108 |
| operbiz | <--- | intent1 | .104 |
| v9intac1 | <--- | INTERNAL_VALUES | .748 |
| v8intre1 | <--- | INTERNAL_VALUES | .695 |
| v4intfu1 | <--- | INTERNAL_VALUES | .755 |
| v7extse1 | <--- | EXTERNAL_VALUES | .758 |
| v5extre1 | <--- | EXTERNAL_VALUES | .702 |

| | | | Estimate |
|---|---|---|---|
| v3extre1 | <--- | EXTERNAL_VALUES | .774 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .806 |
| operbiz | <--- | INTERNAL_VALUES | .434 |
| ae15opi1 | <--- | EAOR1 | .709 |
| operbiz | <--- | EXTERNAL_VALUES | -.063 |

**Squared Multiple Correlations: (1 Nascent Entrepreneurs - Default model)**

| | Estimate |
|---|---|
| EAOR1 | .393 |
| intent1 | .524 |
| EAOR2 | .912 |
| intent2 | .657 |
| EAOR3 | .971 |
| intent3 | .657 |
| v1extbe1 | .649 |
| v3extre1 | .599 |
| v5extre1 | .493 |
| v7extse1 | .575 |
| v4intfu1 | .570 |
| v8intre1 | .483 |
| v9intac1 | .560 |
| operbiz | .419 |
| ae15opi2 | .457 |
| ae14ope2 | .472 |
| ae13opa2 | .491 |
| ae9opbe2 | .495 |
| ae8opco2 | .463 |
| ae5oppe2 | .449 |
| ae4opfo2 | .573 |
| ae15opi3 | .454 |
| ae14ope3 | .459 |
| ae13opa3 | .471 |
| ae9opbe3 | .557 |
| ae8opco3 | .390 |
| ae5oppe3 | .443 |
| ae4opfo3 | .553 |
| ae15opi1 | .502 |
| ae14ope1 | .605 |
| ae13opa1 | .572 |
| ae9opbe1 | .525 |
| ae8opco1 | .585 |
| ae5oppe1 | .529 |
| ae4opfo1 | .469 |

**Exhibit 5.38: Regression Weights, Standardized Regression Weights, & Squared Multiple Correlations - Non-Composite Full Structural Model with Interpersonal Values Removed (*Nascent Entrepreneurs*)**

Exhibit 5.39 identifies those variable relationships that are significant.

| | | |
|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES |
| EAOR1 | <--- | EXTERNAL_VALUES |
| intent1 | <--- | EAOR1 |
| EAOR2 | <--- | EAOR1 |

| | | |
|---|---|---|
| intent2 | <--- | intent1 |
| intent2 | <--- | EAOR2 |
| EAOR3 | <--- | EAOR2 |
| intent3 | <--- | EAOR3 |
| ae4opfo1 | <--- | EAOR1 |
| ae5oppe1 | <--- | EAOR1 |
| ae8opco1 | <--- | EAOR1 |
| ae9opbe1 | <--- | EAOR1 |
| ae13opa1 | <--- | EAOR1 |
| ae14ope1 | <--- | EAOR1 |
| ae9opbe3 | <--- | EAOR3 |
| ae13opa3 | <--- | EAOR3 |
| ae14ope3 | <--- | EAOR3 |
| ae15opi3 | <--- | EAOR3 |
| ae5oppe2 | <--- | EAOR2 |
| ae8opco2 | <--- | EAOR2 |
| ae9opbe2 | <--- | EAOR2 |
| ae13opa2 | <--- | EAOR2 |
| ae14ope2 | <--- | EAOR2 |
| ae15opi2 | <--- | EAOR2 |
| ae4opfo2 | <--- | EAOR2 |
| ae8opco3 | <--- | EAOR3 |
| ae5oppe3 | <--- | EAOR3 |
| ae4opfo3 | <--- | EAOR3 |
| operbiz | <--- | intent3 |
| v9intac1 | <--- | INTERNAL_VALUES |
| v8intre1 | <--- | INTERNAL_VALUES |
| v4intfu1 | <--- | INTERNAL_VALUES |
| v7extse1 | <--- | EXTERNAL_VALUES |
| v5extre1 | <--- | EXTERNAL_VALUES |
| v3extre1 | <--- | EXTERNAL_VALUES |
| v1extbe1 | <--- | EXTERNAL_VALUES |
| operbiz | <--- | INTERNAL_VALUES |
| ae15opi1 | <--- | EAOR1 |

**Exhibit 5.39: Significant Relationships Identified - Non-Composite Full Structural Model with Interpersonal Values Removed**
**(*Nascent Entrepreneurs*)**

Exhibit 5.40 presents the regression weights, standardized regression weights, and squared multiple correlations for the Non-Composite Full Structural Model with Interpersonal Values removed for the Non-Entrepreneur Group.

**Regression Weights: (2 Non-Entrepreneurs - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .156 | .120 | 1.296 | .195 | par_117 |
| EAOR1 | <--- | EXTERNAL_VALUES | -.026 | .134 | -.195 | .845 | par_122 |
| EAOR2 | <--- | EXTERNAL_VALUES | .089 | .045 | 1.984 | .047 | par_125 |
| EAOR2 | <--- | INTERNAL_VALUES | -.006 | .038 | -.156 | .876 | par_128 |
| intent1 | <--- | EAOR1 | .387 | .038 | 10.068 | *** | par_129 |
| EAOR2 | <--- | EAOR1 | .657 | .080 | 8.259 | *** | par_131 |
| intent2 | <--- | intent1 | -.046 | .224 | -.208 | .835 | par_106 |
| EAOR3 | <--- | INTERNAL_VALUES | .014 | .053 | .255 | .799 | par_124 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.010 | .061 | -.158 | .874 | par_126 |
| intent2 | <--- | EAOR2 | .427 | .136 | 3.139 | .002 | par_127 |
| EAOR3 | <--- | EAOR2 | 1.265 | .155 | 8.149 | *** | par_132 |
| intent3 | <--- | intent2 | -.423 | .519 | -.816 | .415 | par_107 |
| intent3 | <--- | EAOR3 | .526 | .160 | 3.280 | .001 | par_108 |
| ae4opfo1 | <--- | EAOR1 | 1.000 | | | | |
| ae5oppe1 | <--- | EAOR1 | .995 | .093 | 10.648 | *** | par_67 |
| ae8opco1 | <--- | EAOR1 | .950 | .091 | 10.386 | *** | par_68 |
| ae9opbe1 | <--- | EAOR1 | 1.046 | .096 | 10.880 | *** | par_69 |
| ae13opa1 | <--- | EAOR1 | .992 | .088 | 11.308 | *** | par_70 |
| ae14ope1 | <--- | EAOR1 | 1.050 | .095 | 11.077 | *** | par_71 |
| ae9opbe3 | <--- | EAOR3 | .912 | .111 | 8.193 | *** | par_72 |
| ae13opa3 | <--- | EAOR3 | .851 | .116 | 7.339 | *** | par_73 |
| ae14ope3 | <--- | EAOR3 | .869 | .111 | 7.810 | *** | par_74 |
| ae15opi3 | <--- | EAOR3 | .986 | .115 | 8.548 | *** | par_75 |
| ae5oppe2 | <--- | EAOR2 | 1.170 | .188 | 6.240 | *** | par_77 |
| ae8opco2 | <--- | EAOR2 | 1.000 | .174 | 5.733 | *** | par_78 |
| ae9opbe2 | <--- | EAOR2 | 1.129 | .171 | 6.613 | *** | par_79 |
| ae13opa2 | <--- | EAOR2 | 1.019 | .156 | 6.523 | *** | par_80 |
| ae14ope2 | <--- | EAOR2 | 1.356 | .194 | 7.003 | *** | par_81 |
| ae15opi2 | <--- | EAOR2 | 1.169 | .184 | 6.349 | *** | par_82 |
| ae4opfo2 | <--- | EAOR2 | 1.000 | | | | |
| ae8opco3 | <--- | EAOR3 | .948 | .124 | 7.662 | *** | par_103 |
| ae5oppe3 | <--- | EAOR3 | .814 | .114 | 7.141 | *** | par_104 |
| ae4opfo3 | <--- | EAOR3 | 1.000 | | | | |
| operbiz | <--- | intent3 | -.161 | .143 | -1.123 | .262 | par_109 |
| operbiz | <--- | intent2 | .086 | .200 | .428 | .668 | par_110 |
| operbiz | <--- | intent1 | -.032 | .137 | -.236 | .813 | par_111 |
| v9intac1 | <--- | INTERNAL_VALUES | 1.000 | | | | |
| v8intre1 | <--- | INTERNAL_VALUES | 1.155 | .127 | 9.089 | *** | par_112 |
| v4intfu1 | <--- | INTERNAL_VALUES | 1.071 | .119 | 8.976 | *** | par_113 |
| v7extse1 | <--- | EXTERNAL_VALUES | 1.000 | | | | |
| v5extre1 | <--- | EXTERNAL_VALUES | 1.189 | .144 | 8.270 | *** | par_114 |
| v3extre1 | <--- | EXTERNAL_VALUES | 1.152 | .126 | 9.171 | *** | par_115 |
| v1extbe1 | <--- | EXTERNAL_VALUES | 1.046 | .126 | 8.320 | *** | par_116 |
| operbiz | <--- | INTERNAL_VALUES | -.017 | .056 | -.301 | .763 | par_118 |
| ae15opi1 | <--- | EAOR1 | .987 | .097 | 10.217 | *** | par_123 |
| operbiz | <--- | EXTERNAL_VALUES | .072 | .064 | 1.133 | .257 | par_130 |

**Standardized Regression Weights: (2 Non-Entrepreneurs - Default model)**

| | | | Estimate |
|---|---|---|---|
| EAOR1 | <--- | INTERNAL_VALUES | .144 |
| EAOR1 | <--- | EXTERNAL_VALUES | -.022 |
| EAOR2 | <--- | EXTERNAL_VALUES | .106 |
| EAOR2 | <--- | INTERNAL_VALUES | -.008 |
| intent1 | <--- | EAOR1 | .824 |
| EAOR2 | <--- | EAOR1 | .945 |
| intent2 | <--- | intent1 | -.062 |
| EAOR3 | <--- | INTERNAL_VALUES | .014 |
| EAOR3 | <--- | EXTERNAL_VALUES | -.008 |
| intent2 | <--- | EAOR2 | .846 |
| EAOR3 | <--- | EAOR2 | .944 |
| intent3 | <--- | intent2 | -.327 |
| intent3 | <--- | EAOR3 | 1.080 |
| ae4opfo1 | <--- | EAOR1 | .802 |
| ae5oppe1 | <--- | EAOR1 | .848 |
| ae8opco1 | <--- | EAOR1 | .839 |
| ae9opbe1 | <--- | EAOR1 | .865 |
| ae13opa1 | <--- | EAOR1 | .886 |
| ae14ope1 | <--- | EAOR1 | .872 |
| ae9opbe3 | <--- | EAOR3 | .737 |
| ae13opa3 | <--- | EAOR3 | .675 |
| ae14ope3 | <--- | EAOR3 | .704 |
| ae15opi3 | <--- | EAOR3 | .755 |
| ae5oppe2 | <--- | EAOR2 | .661 |
| ae8opco2 | <--- | EAOR2 | .604 |
| ae9opbe2 | <--- | EAOR2 | .707 |
| ae13opa2 | <--- | EAOR2 | .696 |
| ae14ope2 | <--- | EAOR2 | .752 |
| ae15opi2 | <--- | EAOR2 | .673 |
| ae4opfo2 | <--- | EAOR2 | .665 |
| ae8opco3 | <--- | EAOR3 | .697 |
| ae5oppe3 | <--- | EAOR3 | .652 |
| ae4opfo3 | <--- | EAOR3 | .775 |
| operbiz | <--- | intent3 | -.151 |
| operbiz | <--- | intent2 | .062 |
| operbiz | <--- | intent1 | -.031 |
| v9intac1 | <--- | INTERNAL_VALUES | .770 |
| v8intre1 | <--- | INTERNAL_VALUES | .888 |
| v4intfu1 | <--- | INTERNAL_VALUES | .860 |
| v7extse1 | <--- | EXTERNAL_VALUES | .790 |
| v5extre1 | <--- | EXTERNAL_VALUES | .777 |
| v3extre1 | <--- | EXTERNAL_VALUES | .858 |
| v1extbe1 | <--- | EXTERNAL_VALUES | .781 |
| operbiz | <--- | INTERNAL_VALUES | -.033 |
| ae15opi1 | <--- | EAOR1 | .822 |
| operbiz | <--- | EXTERNAL_VALUES | .123 |

**Squared Multiple Correlations: (2 Non-Entrepreneurs - Default model)**

| | Estimate |
|---|---|
| EAOR1 | .020 |
| intent1 | .679 |
| EAOR2 | .906 |
| intent2 | .629 |
| EAOR3 | .893 |
| intent3 | .621 |
| v1extbe1 | .609 |
| v3extre1 | .736 |
| v5extre1 | .603 |
| v7extse1 | .624 |
| v4intfu1 | .740 |
| v8intre1 | .788 |
| v9intac1 | .593 |
| operbiz | .031 |
| ae15opi2 | .453 |
| ae14ope2 | .566 |
| ae13opa2 | .484 |
| ae9opbe2 | .500 |
| ae8opco2 | .364 |
| ae5oppe2 | .437 |
| ae4opfo2 | .442 |
| ae15opi3 | .570 |
| ae14ope3 | .496 |
| ae13opa3 | .455 |
| ae9opbe3 | .543 |
| ae8opco3 | .486 |
| ae5oppe3 | .426 |
| ae4opfo3 | .601 |
| ae15opi1 | .676 |
| ae14ope1 | .760 |
| ae13opa1 | .786 |
| ae9opbe1 | .748 |
| ae8opco1 | .704 |
| ae5oppe1 | .720 |
| ae4opfo1 | .644 |

**Exhibit 5.40: Regression Weights, Standardized Regression Weights, & Squared Multiple Correlations - Non-Composite Full Structural Model with Interpersonal Values Removed (*Non-Entrepreneurs*)**

Exhibit 5.41 identifies those variable relationships that are significant.

| | | |
|---|---|---|
| EAOR2 | <--- | EXTERNAL_VALUES |
| intent1 | <--- | EAOR1 |
| EAOR2 | <--- | EAOR1 |
| intent2 | <--- | EAOR2 |
| EAOR3 | <--- | EAOR2 |
| intent3 | <--- | EAOR3 |
| ae4opfo1 | <--- | EAOR1 |
| ae5oppe1 | <--- | EAOR1 |
| ae8opco1 | <--- | EAOR1 |
| ae9opbe1 | <--- | EAOR1 |
| ae13opa1 | <--- | EAOR1 |
| ae14ope1 | <--- | EAOR1 |

| | | |
|---|---|---|
| ae9opbe3 | <--- | EAOR3 |
| ae13opa3 | <--- | EAOR3 |
| ae14ope3 | <--- | EAOR3 |
| ae15opi3 | <--- | EAOR3 |
| ae5oppe2 | <--- | EAOR2 |
| ae8opco2 | <--- | EAOR2 |
| ae9opbe2 | <--- | EAOR2 |
| ae13opa2 | <--- | EAOR2 |
| ae14ope2 | <--- | EAOR2 |
| ae15opi2 | <--- | EAOR2 |
| ae4opfo2 | <--- | EAOR2 |
| ae8opco3 | <--- | EAOR3 |
| ae5oppe3 | <--- | EAOR3 |
| ae4opfo3 | <--- | EAOR3 |
| v9intac1 | <--- | INTERNAL_VALUES |
| v8intre1 | <--- | INTERNAL_VALUES |
| v4intfu1 | <--- | INTERNAL_VALUES |
| v7extse1 | <--- | EXTERNAL_VALUES |
| v5extre1 | <--- | EXTERNAL_VALUES |
| v3extre1 | <--- | EXTERNAL_VALUES |
| v1extbe1 | <--- | EXTERNAL_VALUES |
| ae15opi1 | <--- | EAOR1 |

**Exhibit 5.41: Significant Relationships Identified - Non-Composite Full Structural Model with Interpersonal Values Removed**
**(*Non-Entrepreneurs*)**

## 3.6 Tests of a Moderating Hypothesis

This section examines for the effect of a moderating hypothesis on the full structural model; that is, whether the strength of the relationships among the exogenous and endogenous variables is different for the Nascent and Non-Entrepreneur Groups. A key assumption for testing a moderating hypothesis is that metric measurement invariance for the variables in the model has been determined. This, in fact, is the case in this research. Invariance testing was undertaken and metric invariance was established for all the model variables in this research. This was reported in Chapter 4. As such, tests for a moderating hypothesis can proceed.

Tests for a moderating hypothesis are somewhat similar to invariance testing. However, whereas invariance testing focuses on the variable, moderating variable testing focuses on the variable relationships. The following steps (in AMOS) were undertaken to test for a moderating effect of group membership (Nascent versus Non-Entrepreneur) (see, for example, Cunningham, 2010):

- Using the Manage Groups function, two groups are established (Nascent and Non-Entrepreneur)
- On the structural model, each item factor loading is set to be the same for each group

- Using the Manage Models function, two models are established: One is an *Unconstrained Model* where all variable relationships are allowed to vary freely and the other is the *Constrained Model* where the relationship between two variables is set to be the same (this is achieved by labelling the relationship of interest to be p1 for one group (say, for the Nascent Entrepreneur Group) and p2 for the other group (say for the Non-Entrepreneur Group). Thus, in the Constrained Model syntax, p1=p2.
- The model is then run and a Chi-square difference test is performed between the two models (this is reported in the AMOS output).

Exhibits 5.42 and 5.43 show the non-composite full structural models with the variable item factor loadings set to be equal and the Internal Values – Entrepreneurial Attitude at $T_1$ relationship set to equality (p1=p2) as this relationship is being tested for the effect of a moderating group variable (in this example). Exhibit 5.42 shows p1 being reflected in the Internal Values-Entrepreneurial Attitude @ $T_1$ relationship (p1 was set for the Nascent Entrepreneur Group). Exhibit 5.43 shows p2 being reflected in the Internal Values-Entrepreneurial Attitude @ $T_1$ relationship (p2 was set for the Nascent Entrepreneur Group). Everything else in the models is the same. A similar approach was undertaken with all the variable relationships to determine whether there were different for the two Groups.

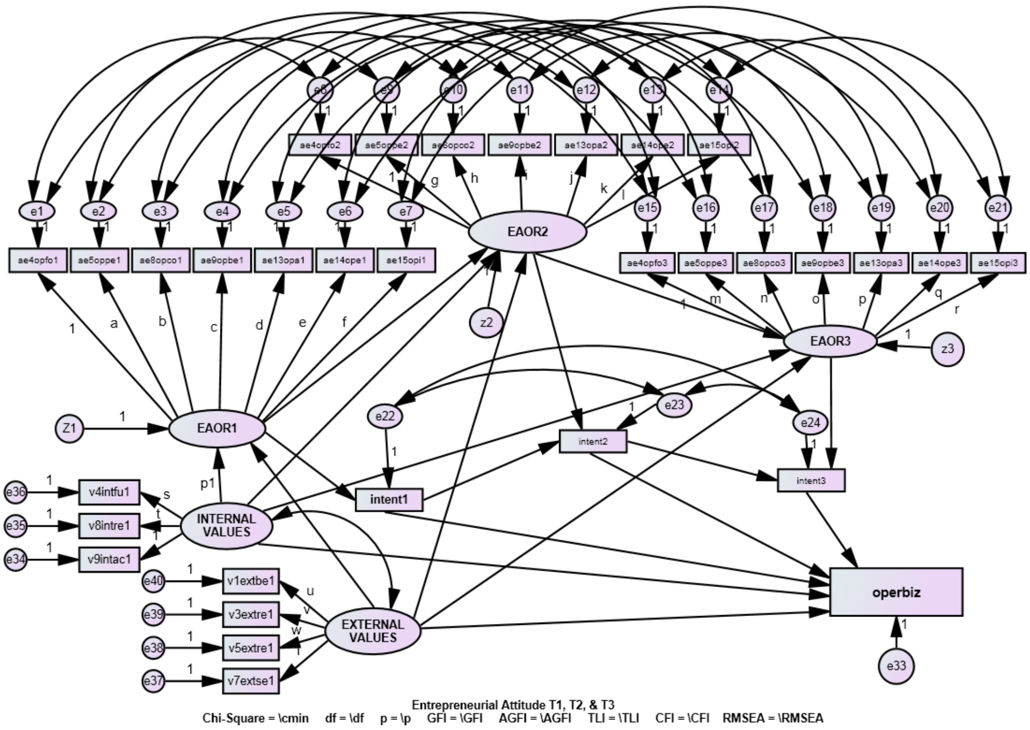



**Exhibit 5.42: Full Structural Model Settings for Tests of a Moderating Hypothesis on the Internal Values-Entrepreneurial Attitude @ T1 Relationship**
**(*Nascent Entrepreneurs*)**

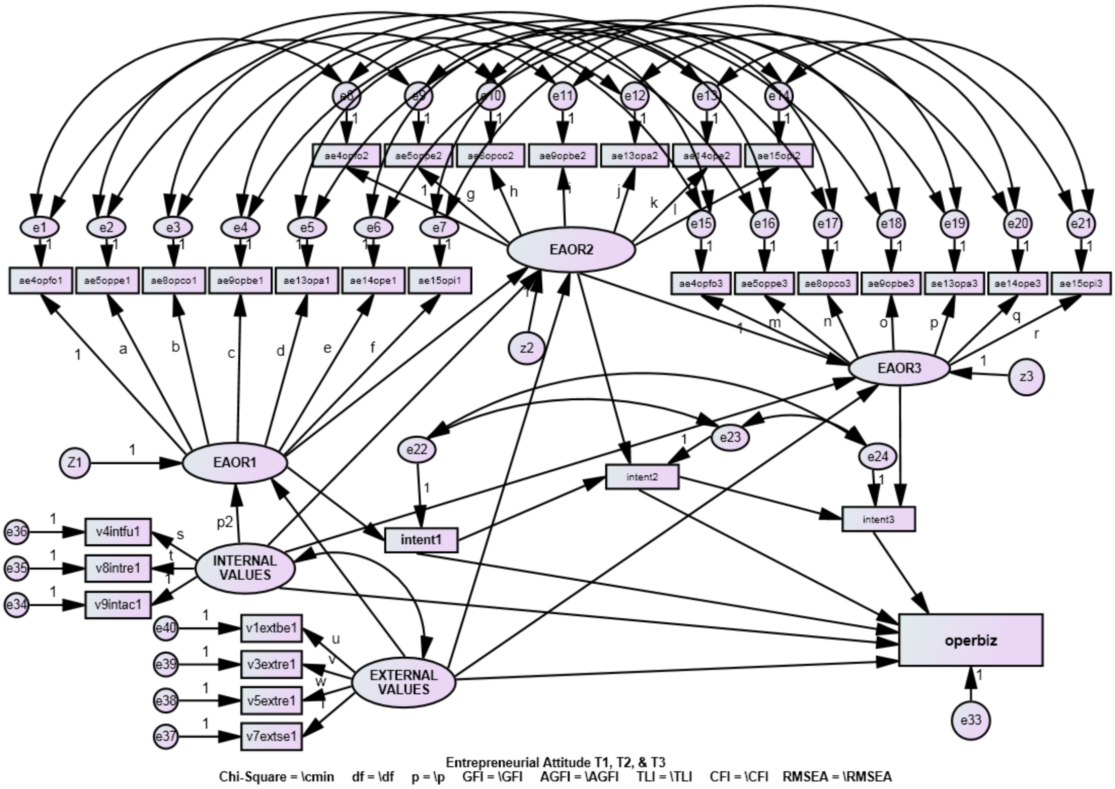



**Exhibit 5.43: Full Structural Model Settings for Tests of a Moderating Hypothesis on the Internal Values-Entrepreneurial Attitude @ T1 Relationship**
**(*Non-Entrepreneurs*)**

Exhibit 5.44 presents the results of the tests for whether relationships between variables are moderated by group (that is, whether the relationships were different for the Nascent Entrepreneur versus the Non-Entrepreneur Groups).

| Relationship Variable 1 | | Variable 2 | Model | DF | CMIN | P | NFI Delta-1 | IFI Delta-2 | RFI rho-1 | TLI rho2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Internal Values** | **-** | **Entrepreneurial Attitude @ T1** | Constrained | 1 | 8.021 | **0.005** | 0.001 | 0.001 | 0.001 | 0.001 |
| Internal Values | - | Entrepreneurial Attitude @ T2 | Constrained | 1 | 0.000 | 1.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Internal Values | - | Entrepreneurial Attitude @ T3 | Constrained | 1 | 0.022 | 0.883 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Internal Values** | **-** | **Business Start-Up Behaviour** | Constrained | 1 | 28.340 | **0.000** | 0.003 | 0.003 | 0.003 | 0.003 |
| **External Values** | **-** | **Entrepreneurial Attitude @ T1** | Constrained | 1 | 4.059 | **0.044** | 0.000 | 0.000 | 0.000 | 0.000 |
| External Values | - | Entrepreneurial Attitude @ T2 | Constrained | 1 | 3.277 | 0.070 | 0.000 | 0.000 | 0.000 | 0.000 |
| External Values | - | Entrepreneurial Attitude @ T3 | Constrained | 1 | 0.077 | 0.781 | 0.000 | 0.000 | 0.000 | 0.000 |
| External Values | - | Business Start-Up Behaviour | Constrained | 1 | 2.608 | 0.106 | 0.000 | 0.000 | 0.000 | 0.000 |
| Entrepreneurial Attitude @ T1 | - | Entrepreneurial Attitude @ T2 | Constrained | 1 | 2.143 | 0.143 | 0.000 | 0.000 | 0.000 | 0.000 |
| Entrepreneurial Attitude @ T2 | - | Entrepreneurial Attitude @ T3 | Constrained | 1 | 0.978 | 0.323 | 0.000 | 0.000 | 0.000 | 0.000 |
| Entrepreneurial Attitude @ T1 | - | Intent1 | Constrained | 1 | 2.529 | 0.112 | 0.000 | 0.000 | 0.000 | 0.000 |
| Entrepreneurial Attitude @ T2 | - | Intent2 | Constrained | 1 | 0.217 | 0.641 | 0.000 | 0.000 | 0.000 | 0.000 |
| Entrepreneurial Attitude @ T3 | - | Intent3 | Constrained | 1 | 0.039 | 0.844 | 0.000 | 0.000 | 0.000 | 0.000 |
| Intent1 | - | Business Start-Up Behaviour | Constrained | 1 | 1.220 | 0.269 | 0.000 | 0.000 | 0.000 | 0.000 |
| Intent2 | - | Business Start-Up Behaviour | Constrained | 1 | 1.109 | 0.292 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Intent3** | **-** | **Business Start-Up Behaviour** | Constrained | 1 | 14.549 | **0.000** | 0.001 | 0.001 | 0.001 | 0.002 |
| Intent1 | - | Intent2 | Constrained | 1 | 2.470 | 0.116 | 0.000 | 0.000 | 0.000 | 0.000 |
| Intent2 | - | Intent3 | Constrained | 1 | 0.696 | 0.404 | 0.000 | 0.000 | 0.000 | 0.000 |

**Exhibit 5.44: Results of Tests for Whether Relationships Between Variables are Moderated by Group**

As can be seen, there are four relationships that are significant. These are:

- Internal Values - Entrepreneurial Attitude @ T1 (p<0.005)
- Internal Values - Business Start-Up Behaviour (p<0.000)

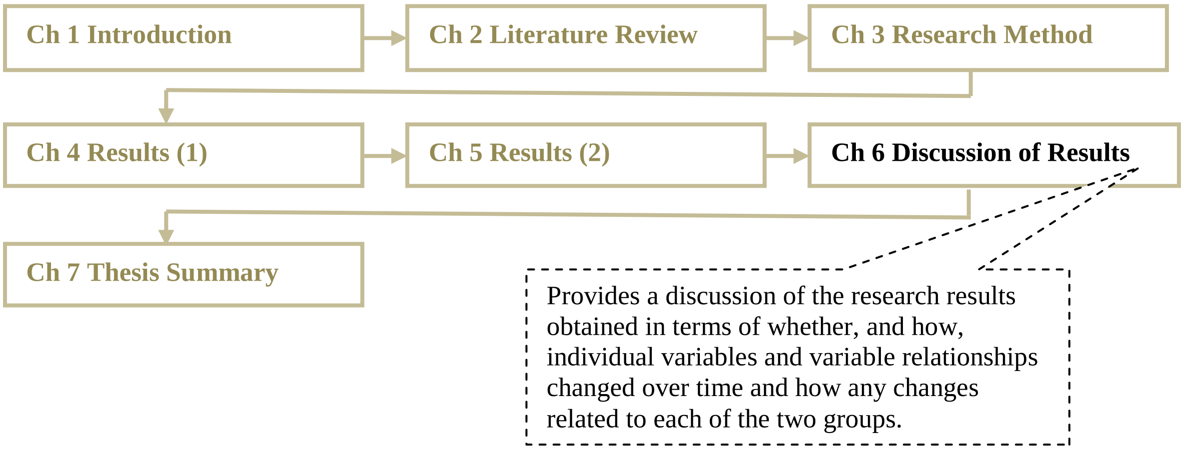
- External Values - Entrepreneurial Attitude @ T1 ($p<0.044$)
- Intent3 - Business Start-Up Behaviour ($p<0.000$)

This implies that the moderating variable, (Nascent Entrepreneur - Non-Entrepreneur ) Group Type, has a moderating effect on these relationships.

## 5.0 Chapter Summary

Chapter 5 provides details of the research results for the full structural model. The full model was presented and then the model was modified to incorporate a composite for the Entrepreneurial Attitude variable. This was done to determine if there was any improvement in stabilizing the parameter estimates since the use of composites has been used for this purpose. After developing composite variables for Entrepreneurial Attitude at $T_1$, $T_2$, and $T_3$, it was determined that the initial non-composite model performed just as well as the composite structural model and that there were many similarities among the parameter estimates for the two models. Since the non-composite model provided a richer source of data (because it was not aggregated), the non-composite full structural model was selected to form the basis for the discussion in Chapter 6. This model also formed the basis for undertaking tests of a group moderating variable that evaluated whether the relationships between variables differed for each group (Nascent versus Non-Entrepreneur).

# Chapter 6
# Discussion of Results




## 1.0 Introduction

Chapter 6 revisits the hypotheses developed and identifies whether these were supported by the research results. The Chapter then provides an interpretation of what the results mean. The ensuing discussion builds upon and extends prior theory associated with the variables examined. The stability of the variable means is first discussed followed by a discussion of the variable relationships in terms of how these developed over time (at $T_1$, $T_2$, and $T_3$) within and between the nascent and non-entrepreneur groups.

As a general context for this Chapter, the following issues are raised. First, most entrepreneurship behavioural studies focus on entrepreneurs who are (implicitly or explicitly) opportunity-oriented; that is, entrepreneurs who started businesses because they wanted to – because they saw an opportunity. In contrast, this research focuses on necessity (Reynolds, Bygrave, Autio, Cox, and Hay, 2002; Herrington, Kew, and Kew, 2008; Kelley, Singer, and Herrington, 2011) nascent (McGee, Peterson, Mueller, and Sequeira, 2009) entrepreneurs (those who intended to start businesses because they had to – for economic survival reasons since jobs were hard to obtain and because there is little in the way of social security benefits payable to the long-term unemployed in South Africa). Thus, this research extends existing theory (that has primarily been developed using people from WEIRD societies (Henrich, Heine, and Norenzayan, 2010)) by examining the research questions and the conceptual model in a socially and economically disadvantaged developing country context and this provides a point of difference for this research to many other studies of this nature.

Second, this research focused on the business start-up behaviour of nascent entrepreneurs. Nascent entrepreneurs are faced with significant uncertainty in attempting to establish and develop their businesses. Uncertainty can take three different forms: (1) That which is "known" (where the uncertainty consists of a known distribution of outcomes but an unknown group of "draws"); (2) that which is "unknown" (the uncertainty consists of an unknown distribution of outcomes and an unknown group of draws); and, (3) that which is "unknowable" (the uncertainty consists of a non-existent distribution of outcomes where the very occurrences are unclassifiable) (Knight, 1921). Using Knight's (1921) taxonomy, it can be seen that nascent entrepreneurs face making business start-up decisions within an unknown uncertainty context. This uncertainty increases considerably when (1) the situation is contextualised in a developing country, (2) where there is social and economic disadvantage faced by the nascent entrepreneurs, and (3) where there are pressures for starting a business because there are no employment opportunities available and little in the way of social security benefits payable to the long-term unemployed.

Predicting outcomes in uncertain environments is difficult at the best of times. Conventional thinking, however, suggests that entrepreneurs start businesses based upon their ability to "predict" market potential (see, for example, Sarasvathy, 2001). Entrepreneurs, however, do not necessarily believe that prediction is easy (Sarasvathy, 2001). Uncertain environments can therefore lead to effectual (rather than predictive) behaviour (Sarasvathy, 2001; Dew, Read, Sarasvathy, and Wiltbank, 2009, 2011). Thus, whereas prediction and causal strategies may be relevant "when the future is predictable, goals are clear, and the environment is independent of (the entrepreneur's) actions; effectual strategies (may be more) useful when the future is unpredictable, goals are unclear and the environment is driven by human action" (Sarasvathy, 2008, p. 73).

Hence, although nascent (necessity) entrepreneurs may develop business plans (that reflect prediction and causal strategies) about starting their businesses, their actual entrepreneurial behaviour may be more effectual in uncertain environments. Although examining the predictive versus effectual behaviour of participants in this research was not specifically examined, the completion of business plans by participants was to be the final step in the entrepreneurship training and mentoring intervention program. Many participants, however, did *not* submit a business plan. A major reason cited by many of the participants who were interviewed was that they found it difficult to develop a business plan when they did not believe that they were in a position to forecast the future market potential of the products and/or services they were offering. This suggests that their behaviour was effectual - at least in part.

A third issue to be considered when reading this thesis has to do with the repeated measures longitudinal nature of the research. This design allowed for insights into variable behaviour and their inter-relationships that are difficult to observe and capture in cross-sectional studies. Taking repeated measures over time provided for increased insights into those variables and their inter-relationships. Thus, this research contributes toward reducing some of the gaps unable to be addressed in cross-sectional studies.

## 2.0 Hypothesis Results

Appearing below are the hypotheses identified in this research and whether there is support for these hypotheses. A discussion of the results appears in the following sections.

H1: Not all nascent entrepreneurs will engage in business start-up behaviour. This hypothesis was *supported*. Some nascent entrepreneurs had completely operationalized their business start-ups and commenced trading at $T_3$ while others had started the process but had not finished.

H2: An underlying reason for nascent entrepreneurs not starting their businesses will be a lack of access to the necessary resources. This hypothesis was *supported*. Interviews indicated that a lack of resources inhibited business start-up.

H3: Entrepreneurial intentions will be a good predictor of business start-up behaviour in the *short term* for nascent entrepreneurs. This hypothesis was *supported*. There was a significant relationship between entrepreneurial intentions and business start-up behaviour at $T_3$ for nascent entrepreneurs. There was no significant relationship between entrepreneurial intentions and business start-up behaviour at $T_3$ for non-entrepreneurs

H4: Entrepreneurial intentions will be a poor predictor of business start-up behaviour in the *longer term* for nascent entrepreneurs. This hypothesis was *supported*. For nascent entrepreneurs, there was a non-significant relationship between entrepreneurial intentions and business start-up behaviour at $T_1$ and $T_2$ (but the start-up behaviour still eventuated which was associated with a significant entrepreneurial intentions – business start-up behaviour relationship at $T_3$).

H5: There will be a relationship between values and business start-up behaviour for both nascent and non-entrepreneurs. This hypothesis was only *partially supported*. For nascent entrepreneurs, there was a significant relationship between internal values and business start-up behaviour (but not for an external values-business start-up behaviour relationship). For the non-entrepreneur group, there was no significant relationship between either internal or external values and business start-up behaviour.

H6: Values will be stable over the life of the research project for both nascent and non-entrepreneurs. This hypothesis was *supported*. Values were stable over the duration of the research for both nascent and non-entrepreneurs.

H6.1: Nascent entrepreneurs will have different values to non-entrepreneurs. This hypothesis was *not supported*. In terms of LOV, both nascent and non-entrepreneurs demonstrated internal, external, and interpersonal values (but the strength of these values differed between the two groups – see Hypotheses' 7-10 below).

H7: Nascent entrepreneur internal values will be higher than non entrepreneurs. This hypothesis was *supported*. There was a significant difference between nascent and non-entrepreneur internal values with these being higher for nascent entrepreneurs.

H8: There will be no differences in nascent entrepreneur and non-entrepreneur external values. This hypothesis was *not supported*. There was a significant difference between nascent and non-entrepreneur external values with these being higher for nascent entrepreneurs.

H9: There will be no differences in nascent entrepreneur and non-entrepreneur interpersonal values. This hypothesis was *supported*.

H10: Interpersonal values will be lower than internal and external values for both nascent and non-entrepreneurs. This hypothesis was *not supported*. Although interpersonal values were the lowest type of values for nascent entrepreneurs, interpersonal values were the highest type of values for non-entrepreneurs.

H11: Nascent entrepreneurs will have a stronger entrepreneurial attitude than non-entrepreneurs. This hypothesis was only *partially supported*. Nascent entrepreneurs had a stronger entrepreneurial attitude at $T_1$ and $T_3$ compared with the non-entrepreneurs. However, at $T_2$ (immediately after the entrepreneurship training and mentoring intervention), the non-entrepreneurs had a stronger entrepreneurial attitude than the nascent entrepreneurs.

H12: Nascent entrepreneurs will exhibit a positive internal values-entrepreneurial attitude relationship. This hypothesis was only *partially supported*. For nascent entrepreneurs, there was a significant relationship between internal values and entrepreneurial attitude at $T_1$, but not at $T_2$ or $T_3$. (For non-entrepreneurs, there was no significant relationship between internal values and entrepreneurial attitude at $T_1$, at $T_2$ or $T_3$.)

H13: Nascent entrepreneurs will exhibit a positive external values-entrepreneurial attitude relationship. This hypothesis was only *partially supported*. For nascent entrepreneurs, there was a significant relationship between external values and entrepreneurial attitude at $T_1$, but not at $T_2$ or $T_3$. (For non-entrepreneurs, there was no significant relationship between external values and entrepreneurial attitude at $T_1$, or $T_3$ but there was at $T_2$.)

H14: Nascent entrepreneurs will not exhibit a positive interpersonal values-entrepreneurial attitude relationship. This hypothesis was *supported*. Nascent entrepreneurs did not exhibit a significant interpersonal values – entrepreneurial attitude relationship at either $T_1$, $T_2$, or $T_3$. (Non-entrepreneurs also did not exhibit a significant interpersonal values – entrepreneurial attitude relationship at either $T_2$ or $T_3$ but did so at $T_1$.)

H15: There will be a relationship between entrepreneurial attitude and entrepreneurial intentions for nascent entrepreneurs. This hypothesis was *supported*. For nascent entrepreneurs, there was a significant relationship between entrepreneurial attitude and entrepreneurial intentions at $T_1$, $T_2$, and $T_3$. (For non-entrepreneurs, there was a significant relationship between entrepreneurial attitude and entrepreneurial intentions at $T_1$ and $T_2$ but not at $T_3$.)

H16: Entrepreneurial intentions will be non-linear over time for both nascent and non-entrepreneurs. This hypothesis was *supported*. There were significant entrepreneurial intention differences between $T_1$ and $T_2$, $T_2$ and $T_3$, and $T_1$ and $T_3$ for both nascent and non-entrepreneurs.

H17: Non-entrepreneurs will not engage in business start-up behaviour. This hypothesis was *supported*. None of the non-entrepreneurs started businesses during the life of the research project.

Exhibit 6.1 provides a summary of the hypothesis relationships identified appearing above (H1 – H17).

| No. | Hypothesis | Level of Support |
|---|---|---|
| H1 | Not all nascent entrepreneurs will engage in business start-up behaviour. | Supported |
| H2 | An underlying reason for nascent entrepreneurs not starting their businesses will be a lack of access to the necessary resources. | Supported |
| H3 | Entrepreneurial intentions will be a good predictor of business start-up behaviour in the short term for nascent entrepreneurs. | Supported |
| H4 | Entrepreneurial intentions will be a poor predictor of business start-up behaviour in the longer term for nascent entrepreneurs. | Supported |
| H5 | There will be a relationship between values and business start-up behaviour for both nascent and non-entrepreneurs. | Partially Supported |
| H6 | Values will be stable over the life of the research project for both nascent and non-entrepreneurs. | Supported |
| H6.1 | Nascent entrepreneurs will have different values to non-entrepreneurs. | Not Supported |
| H7 | Nascent entrepreneur internal values will be higher than non entrepreneurs. | Supported |
| H8 | There will be no differences in nascent entrepreneur and non-entrepreneur external values. | Not Supported |
| H9 | There will be no differences in nascent entrepreneur and non-entrepreneur interpersonal values. | Supported |
| H10 | Interpersonal values will be lower than internal and external values for both nascent and non-entrepreneurs. | Not Supported |
| H11 | Nascent entrepreneurs will have a stronger entrepreneurial attitude than non-entrepreneurs. | Partially Supported |
| H12 | Nascent entrepreneurs will exhibit a positive internal values-entrepreneurial attitude relationship. | Partially Supported |
| H13 | Nascent entrepreneurs will exhibit a positive external values-entrepreneurial attitude relationship. | Partially Supported |
| H14 | Nascent entrepreneurs will not exhibit a positive interpersonal values-entrepreneurial attitude relationship. | Supported |
| H15 | There will be a relationship between entrepreneurial attitude and entrepreneurial intentions for nascent entrepreneurs. | Supported |
| H16 | Entrepreneurial intentions will be non-linear over time for both nascent and non-entrepreneurs. | Supported |
| H17 | Non-entrepreneurs will not engage in business start-up behaviour. | Supported |

**Exhibit 6.1: Summary of Hypothesis Relationships Identified**

## 3.0 Stability of Variable Means over Time

This section discusses the stability of the values, entrepreneurial attitude, and entrepreneurial intention variables between the nascent and non-entrepreneur groups over time at $T_1$, $T_2$, and $T_3$ as well as business start-up behaviour differences at $T_3$. The discussion for this section is based upon the results described in Chapter 4.

### 3.1 Values

This section discusses the results identified for the values construct appearing in the conceptual model. Values are lasting beliefs that a particular type of behaviour is preferable to an opposite form of behaviour (Rokeach, 1973). They characterize cognitive representations of universal human requirements including individual social interaction requirements and social institutional demands (Schwartz and Bilsky, 1987). Values are relatively stable (Kahle, 1983; Rokeach, 1973) and develop via individual heritage and life experiences (Kahle, Poulos, & Sukhdial., 1988). Values help us to rationalize and guide our beliefs, attitudes, and behaviours (Rokeach 1973).

Since values are higher-order social cognitions that are considered to be relatively stable, little or no change in this construct over the period was expected. This was confirmed by the paired samples t-tests. There was no significant change in internal, external, and/or interpersonal values for each of the nascent entrepreneur and non-entrepreneur groups over $T_1$, $T_2$, and $T_3$. This is in line with existing theory (Rokeach, 1973). As a result, for parsimonious reasons, the values measurements at $T_2$ and $T_3$ were not included in the structural model (these are reported in Appendix 4).

There were, however, some values differences and similarities between the two groups; for example, …

- *Internal values* were significantly higher over the project's duration for the nascent entrepreneur group compared to the non-entrepreneur group
- *External values* were significantly higher over the project's duration for the non-entrepreneur group compared to the nascent entrepreneur group
- There were no significant *interpersonal values* differences over the project's duration between the nascent and non-entrepreneur groups.

*Internal values*: Internal values are built around self-belief … self-respect (to be proud of myself and confident of who I am), self-fulfilment (to find peace of mind and to make the best use of my talents), and a sense of accomplishment (to succeed at what I want to do) (Kahle 1983; Kahle, Beatty, & Homer 1986).

For all the participants in this research project, having a belief in self was difficult because of the disadvantaged social and economic circumstances that surrounded each participant. Participant self-esteem was extremely low at the commencement of the program which necessitated introducing counselling and motivational sessions that were designed to boost participant self esteem. This was relatively successful and, only after this, could the entrepreneurship training component be introduced.

Having said this, the nascent entrepreneurs in this research had a greater belief in themselves compared to the non-entrepreneurs. Self-belief appears crucial in establishing a business in a society where there is significant uncertainty stemming from a lack of financial, social, and other resources as well as peer pressures to conform to community norms (that are not necessarily centred upon entrepreneurship). In fact, discussions with nascent entrepreneur participants suggested that there existed significant family pressures to find a job (rather than establish a business) so that they could generate a reliable revenue stream that could be used to support the family.

*External values*: External values are founded upon one's belief in self through relations with others (including the need to be protected … to be secure). This includes to have a sense of belonging (to be accepted and be needed by friends, family, and community), having warm relationships with others (to have close companionship and intimate friendship), being well-respected (to be admired by others and to receive recognition), and security (to be safe and protected from misfortune and attack) (Kahle 1983; Kahle, Beatty, & Homer 1986).

The external values dimension was important to both the nascent and non-entrepreneur groups – though it was only of secondary importance to the nascent entrepreneurs (but the dominant values dimension for the non-entrepreneur group). Thus, for the nascent entrepreneurs in this research, although a strong belief in self is important, there also appears to be a nexus between nascency and ability to relate to others. This appears to be intuitively appealing since entrepreneurs need to be able to build internal and external teams and need to be able to sell and communicate with others in establishing and developing their businesses. Thus, the development of a strong external values system is important. However, although security is important to nascent entrepreneurs, it is also secondary in terms of the level of importance to this group. Security is aligned with starting a business for nascent necessity entrepreneurs whereas for non-entrepreneurs, security is aligned with other issues including obtaining a job. Similarly, for the non-entrepreneur group, one's ability to be able to relate and communicate with others is aligned more with obtaining and keeping a job as well as interacting with the community.

*Interpersonal values*: Interpersonal values are comprised of values associated with fun and excitement … excitement (to experience stimulation and thrills) and fun and enjoyment (to lead a pleasurable happy life) (Kahle 1983; Kahle, Beatty, & Homer 1986). These values were rated the lowest in importance by both the nascent and non-entrepreneur groups and there was no significant difference between the two groups on this values dimension. This could be interpreted as implying that in a disadvantaged socio-economic environmental context such as was the case in this research, fun and excitement values do not rate as being as important as believing in self and being able to relate to others. It seems that internal and external values are far more important for survival in socially and economically disadvantaged communities. Fun and excitement may be "nice-to-haves" in disadvantaged communities but these do not appear to be critical. Whether fun and excitement values are important for (and reflected in) healthy, affluent, and vibrant communities is beyond the scope of this research and future studies should examine this issue.

*A closing comment*: It would appear that low levels of internal and external values may *not* be conducive to socially and economically disadvantaged individuals engaging in business start-ups; that is, individuals who demonstrate low internal and external value levels may not be suitable candidates for establishing and developing businesses. Thus, if scarce entrepreneurship training resources need to be applied judiciously then it may be prudent to screen applicants on the basis of their personal values favouring those that demonstrate higher internal and external values (however, although repeated measures over time were taken, these results cannot be considered conclusive and do warrant further investigation).

### 3.2 Entrepreneurial Attitude

Attitude represents an individual's favourable or unfavourable predisposition toward an object (Ajzen, 1982). Values play a key role in shaping attitudes (Homer & Kahle (1988); Kropp, Lavack, and Silvera, 2005); however, unlike values, attitudes are less able to provide an inner-oriented stable understanding of individuals (Rokeach 1973; Rokeach and Ball-Rokeach, 1989) since attitudes can change over time through exposure to differing situations and experiences (such as when exposed to a training program).

Prior studies suggest that entrepreneurs exhibit attitudes that are different from those of non-entrepreneurs (see, for example, Robinson, Stimpson, Heufner, and Hunt, 1991; McCline, Bhat, and Baj, 2000). Thus, it is expected that the nascent entrepreneurs in this research will demonstrate stronger entrepreneurial attitudes than those of the non entrepreneurs.

In this regard, the following results were obtained:

- The nascent entrepreneur group commenced the program (at $T_1$) with a stronger entrepreneurial attitude than the non-entrepreneur group
- Entrepreneurial attitude changed over time for both the nascent and non-entrepreneur groups
- The nascent entrepreneur group demonstrated a significantly higher entrepreneurial attitude at $T_1$ and $T_3$ compared to the non-entrepreneur group
- Compared to $T_1$, a significant change in entrepreneurial attitude occurred at $T_2$ for both groups – this was immediately after the one year entrepreneurship training and mentoring intervention (the nascent entrepreneur group's entrepreneurial attitude decreased and the non-entrepreneur group's entrepreneurial attitude increased at this point)
- There was no significant entrepreneurial attitude difference between the two groups at $T_2$
- Entrepreneurial attitude decreased significantly from the $T_2$ high for each group but the $T_3$ levels were higher than at $T_1$ for each group
- At $T_3$, there was a significant increase in entrepreneurial attitude over the $T_1$ level for the nascent entrepreneur group but not for the non-entrepreneur group.

Based on the above, the following points are made. First, previous studies by Robinson, Stimpson, Heufner, and Hunt (1991) and McCline, Bhat, and Baj (2000) that focused on existing entrepreneurs were unable to determine whether entrepreneurial attitudes existed prior to business start-up (or whether these attitudes developed later as a result of the entrepreneurial experience). By longitudinally tracking entrepreneurs as they moved from nascence to practice, this research builds upon and extends previous studies by demonstrating that nascent entrepreneurs do start the nascent process with an entrepreneurial attitude. This is then reinforced with entrepreneurial learning and experience. Thus, as they become more seasoned, their entrepreneurial self-efficacy will develop over time.as a result.

Second, previous studies (see, for example, Robinson, Stimpson, Heufner, and Hunt (1991) and McCline, Bhat, and Baj (2000)) demonstrated that entrepreneurial attitude provides the basis for distinguishing between entrepreneurs and non-entrepreneurs (where the entrepreneurs are (implicitly) opportunity-focused). This study builds upon and extends prior research by examining entrepreneurs who intend starting businesses out of *necessity*. In support of these previous cross-sectional studies, entrepreneurial attitude was useful in this research in differentiating necessity entrepreneurs from non-entrepreneurs at the end of the study ($T_3$) where the nascent entrepreneurs began to start their businesses. Those in the entrepreneur group demonstrated a significantly higher entrepreneurial attitude than those in the non-entrepreneur group. Thus, this research extends prior opportunity-focused entrepreneur research to the necessity entrepreneur domain. Entrepreneurial attitude appears to be a useful construct for differentiating *necessity-based entrepreneurs* from non-entrepreneurs.

Third, entrepreneurial attitude was successful in differentiating between the two groups at the commencement of the program (as well as at the end of the program). Nascent entrepreneurs demonstrated a significantly higher entrepreneurial attitude than non-entrepreneurs. Thus, this research extends the finding of prior studies (where entrepreneurial attitude was used to distinguish between *existing* entrepreneurs and non-entrepreneurs) by identifying entrepreneurial attitude as a good discriminator between *nascent* and non-entrepreneurs.

Fourth, although entrepreneurial attitude was successful at $T_1$ and $T_3$ in differentiating between nascent and non-entrepreneurs, it did not discriminate between the two groups at $T_2$ - immediately after the entrepreneurship training and mentoring intervention. At $T_2$, there was no significant difference between the means of the two groups. These results reveal that attitudes can and do change over time particularly when attending events such as entrepreneurship training programs (that are designed to effect change in individuals). Thus, entrepreneurial attitude may <u>not</u> be a good construct to use when attempting to distinguish nascent (necessity) entrepreneurs from non-entrepreneurs. Values may be a more useful construct since it was found to be stable over time and there were significant differences between the nascent and non-entrepreneur groups.

Fifth, the changeability of entrepreneurial attitude for both groups also reveals a shortcoming with cross-sectional studies generally when it comes to measuring (at least some) psychological variables. Taking psychological measurements at only one point in time may produce erroneous results – depending on when they are taken. Behavioural researchers need to consider whether repeated measures longitudinal research designs may be more appropriate in certain instances. Conclusions drawn and inferences made that emanate from the results of cross-sectional behavioural studies need to be interpreted for what they are acknowledging the limitations that characterize them.

Sixth, the entrepreneur group demonstrated an entrepreneurial attitude prior to the commencement of the intervention at $T_1$, a significantly greater entrepreneurial attitude at the end of the intervention ($T_2$), and a reduced entrepreneurial attitude at $T_3$ - but significantly greater than at $T_1$. The non-entrepreneur group demonstrated a lower entrepreneurial attitude prior to their exposure to the commencement of the entrepreneurship training and mentoring intervention at $T_1$, a significantly strong entrepreneurial attitude at the end of the intervention ($T_2$), and a significantly reduced entrepreneurial attitude at $T_3$ compared to $T_2$ - and not significantly different than that at $T_1$. Thus, it can be concluded that the entrepreneurship training and mentoring intervention program did not have a lasting effect on the non-entrepreneur group. The effects of their participating in the program peaked immediately after the program but these were not sustained three and a half years on.

In contrast, the nascent entrepreneurs' entrepreneurial attitude remained at a significantly higher level (at T3) compared to when they started the intervention program (at T1). Thus, the intervention may have had a greater effect on the nascent entrepreneurs than the non-entrepreneurs. The time spent by the nascent entrepreneur group researching and developing their businesses, as well as the time spent learning about entrepreneurship principles in the class room together with the individual mentoring they received, possibly contributed to the significant increase in their entrepreneurial attitude. Thus, entrepreneurship training and mentoring appears to have a greater sustained effect on those wanting to start businesses than those who do not.

*A closing comment*: It would appear that where there are scarce resources available for exposing individuals to entrepreneurship training, a better longer term decision for the community (in terms of attempting to achieve sustainable increased entrepreneurial activity) may be obtained from enrolling those individuals in a program who already have an entrepreneurial attitude as the probability of this increasing appears enhanced for this group. Immersing those individuals in such a program who do not possess an entrepreneurial attitude prior to participation may not result in any significant increased and/or sustainable long-term entrepreneurial attitude development. In addition, if attempting to differentiate between nascent and non-entrepreneurs, values may prove to be more useful when used in conjunction with entrepreneurial attitudes than using entrepreneurial attitudes alone.

## 3.3 Entrepreneurial Intention

The intention to start a business – entrepreneurial intention – involves a process that develops over time. This process involves individuals exploring possibilities (McMullen and Shepherd, 2006; Choi, Levesque, and Shepherd, 2008). During this process, these individuals are regarded as nascent entrepreneurs and they are active in planning to start their businesses (Shaver, Carter, Gartner, and Reynolds, 2001) … they collect information about potential opportunities, the resources they will need, and they evaluate the potential of particular opportunities they have identified.

Entrepreneurial intentions may be manifested in one of two ways (Bhave, 1994). One way is for an individual to recognize a potential opportunity and this leads to the development of intentions to start a business. This has been referred to as *externally stimulated opportunity recognition* (Bhave, 1994). In this situation, an individual becomes an entrepreneur not necessarily through any proactive plan but by being "pushed" (Smilor and Feeser, 1991) by others into the role of developing entrepreneurial intentions as a result (Douglas, 2009). In contrast to this approach, an individual may develop entrepreneurial intentions first and then, as a result, search for a suitable business opportunity (Douglas, 2009). This approach has been referred to as *internally stimulated opportunity recognition* (Bhave, 1994). In this situation, an individual wants to be an entrepreneur and may explore various opportunities before settling on one that appears to have the potential for him/her to exploit (McMullen and Shepherd, 2006). In this research, the majority of participants were internally stimulated. At the commencement of the research project, they had no idea of the business opportunities they would pursue; these emerged over the life of the study. In many cases, the process was assisted through running "technical" workshops on the types of businesses that participants could engage in (such as making and selling biltong, making and selling the wooden boxes that the biltong was sold in, learning how to become a barista and sell cups of coffee, learning how to produce vegetables in suitable packaging and selling this by the roadside).

The following summarises the entrepreneurial intention results obtained in this research:

- For both the nascent and non-entrepreneur groups …
  - there were significant entrepreneurial intention changes at $T_1$, $T_2$, and $T_3$ with $T_3$ intentions significantly higher than what they were at $T_1$
  - entrepreneurial intentions peaked at $T_2$ (immediately after the training intervention) and there was a significant difference between their intentions immediately after the entrepreneurship training intervention and their intentions at $T_1$ and $T_3$
- There were significant entrepreneurial intention differences between the nascent and non-entrepreneur groups at $T_1$, $T_2$, and $T_3$

These results lead to the following discussion …

First, the entrepreneurship training and mentoring program appears to have had an effect on both the nascent and non-entrepreneur groups with entrepreneurial intention peaking immediately after the training for both groups.

Second, the entrepreneurship training appears to have had a lasting effect on the entrepreneurial intentions of both groups … entrepreneurial intention was significantly higher at the end-of-study for both groups than at the commencement of the program ($T_1$). The results, however, indicate that the nascent entrepreneur group had a higher lasting effect at $T_3$ than the non-entrepreneur group. This may be due to the additional work that the nascent entrepreneur group engaged in while researching their business opportunities and developing their businesses.

Third, there were significant differences between the two groups at $T_1$, $T_2$, and $T_3$ with the nascent entrepreneur group demonstrating significantly higher entrepreneurial intentions at each of the three points where measures were taken. Thus, although the training had an effect on the non-entrepreneur group (entrepreneurial intentions increased), it was insufficient to progress the non-entrepreneur group entrepreneurial intentions sufficiently so that they had similar intentions to the nascent entrepreneur group.

*A closing comment*: Although the entrepreneurship training and mentoring program was beneficial to the non-entrepreneurs in that their entrepreneurial intentions resulted in a sustainable long term increase over the life of the research project, the intervention program was ineffective in increasing their entrepreneurial intentions sufficiently for them to start their own businesses. This is an important finding since intentions are a good indicator of behaviour (Ajzen, 1991). However, from a practical perspective, the development of the non-entrepreneurs' entrepreneurial intentions may not be wasted since their intentions could possibly be channelled, in a corporate context, whereby non-entrepreneurs, as employees, look to start and develop businesses for their employers and/or mentor others to do so.

### 3.4 Business Start-Up Behaviour

Business start-up behaviour, which is a form of "entrepreneurial behaviour (Bird and Schoedt, 2009), involves creating and developing a new business after having explored possible opportunities upon which to develop the business. This behaviour can involve discrete units of action that may be observable by others (Bird and Schoedt, 2009); thus, one can see the progress being made to create and start a business. Depending on the nature of the business, observable business start-up behaviour activities include securing premises, fitting out the premises with furniture and equipment, registering a business name, mounting signage, taking out display advertisements, developing a web site, hiring and/or employing people in the business, and generating sales (Bird and Schoedt, 2009). Thus, business start-up behaviour involves "doing". This stage follows nascency (gathering information about the business opportunity, evaluating the business opportunity, and developing a business plan) where the focus is on *intention* to start a business (but the business has not yet started).

In this research, as would be expected, there was a significant difference between the business start-up behaviour means of the nascent entrepreneur and non-entrepreneur groups. The nascent entrepreneur group mean was significantly higher than the non-entrepreneur group mean. No member of the non-entrepreneur group had started a business at $T_3$ (and stated that they had no intention of starting one). Members of this group were more interested in finding a job – and some already had.

However, not all members of the nascent entrepreneur group actually had a business fully operational at $T_3$. Even though all had made some progress toward starting a business, some still had a considerable way to go. Discussions with members of the nascent entrepreneur group indicated that there were two issues that impeded their progress in starting businesses. These were a lack of resources and the lack of perceived support from their families. From the theory of planned behaviour perspective, these can be referred to as (a lack of) perceived behavioural control and subjective norms (Ajzen, 1991). No matter how good the intention, if an individual is unable to control (access) the necessary resources required to make a behaviour happen, then there is less of a probability that the behaviour will happen (Ajzen, 1991). Similarly, no matter how great an intention to perform a behaviour, perceived lack of family support for engaging in a behaviour will impede the performance of that behaviour (Ajzen, 1991).

*A closing comment*: Unfortunately, this type of story is all so true in South Africa where a major limitation to facilitating entrepreneurship is a lack of finance access (Berry, Von Blottnitz, Cassim, Kesper, Rajaratnam, and Van Sevenster, 2002; Rogerson, 2004) whether this is for R&D or for business start-ups – even for those start-ups with innovative ideas (Booyens, 2011). Financing for smaller early stage businesses is unavailable from most South African banks (Rosenberg, 2004; Wolf, 2006), the venture capital sector is relatively weak in providing early stage financing to innovative businesses (Wolf, 2006), and there exists high barriers to market entry (Booyens, 2011). Thus, even though many South African nascent entrepreneurs have intentions to start businesses, many of these will be still-born due to a lack of finance availability. In this research, no attempt was made to determine what percentage of businesses failed as a result of an inability to access finance as this was beyond the scope of this research.

## 4.0 Variable Relationships over Time

Whereas the previous section focused on the individual variables appearing in the conceptual model, this section examines the *inter-relationships* among the variables. The discussion in this section is primarily based on the results identified in Chapter 5.

As a general comment, with only 3% of the business start-up behaviour variance explained in the *non-entrepreneur group* full structural model (that appears in Chapter 5), the model is not useful when applied to non-entrepreneurs. This is to be expected since the focus of the model is on (1) nascent entrepreneurs and/or entrepreneurs not *non*-entrepreneurs, and (2) those variables that influence business start-ups not *non*-business start-ups. Thus, although there are a number of significant relationships appearing in the model for the non-entrepreneur group (these appear in Exhibit 6.2), these are not of interest in this research and are therefore not discussed.

- External Values → Entrepreneurial Attitude at $T_2$
- Entrepreneurial Attitude at $T_1$ → Entrepreneurial Intention at $T_1$
- Entrepreneurial Attitude at $T_2$ → Entrepreneurial Intention at $T_2$
- Entrepreneurial Attitude at $T_3$ → Entrepreneurial Intention at $T_3$
- Entrepreneurial Attitude at $T_1$ → Entrepreneurial Attitude at $T_2$
- Entrepreneurial Attitude at $T_2$ → Entrepreneurial Attitude at $T_3$

**Exhibit 6.2: Significant Variable Relationships for the Non-Entrepreneur Group**

With 43% of the business start-up behaviour variance explained in the *nascent entrepreneur group* full structural model (appearing in Chapter 5), the model provides important insights into what effects business start-up behaviour for the nascent necessity entrepreneur participants in this research. Values, entrepreneurial attitude, and entrepreneurial intentions all make significant contributions. Exhibit 6.3 identifies those variable relationships for the nascent entrepreneur group that were significant:

- Internal Values → Entrepreneurial Attitude at $T_1$
- External Values → Entrepreneurial Attitude at $T_1$
- Internal Values → Business Start-Up Behaviour at $T_3$
- Entrepreneurial Intention at $T_3$ → Business Start-Up Behaviour at $T_3$
- Entrepreneurial Attitude at $T_1$ → Entrepreneurial Intention at $T_1$
- Entrepreneurial Attitude at $T_2$ → Entrepreneurial Intention at $T_2$
- Entrepreneurial Attitude at $T_3$ → Entrepreneurial Intention at $T_3$
- Entrepreneurial Attitude at $T_1$ → Entrepreneurial Attitude at $T_2$
- Entrepreneurial Attitude at $T_2$ → Entrepreneurial Attitude at $T_3$
- Entrepreneurial Intention at $T_1$ → Entrepreneurial Intention at $T_2$

**Exhibit 6.3: Significant Variable Relationships for the Nascent Entrepreneur Group**

*Moderating Variable Effects*: In this section, moderating variable effects are discussed. A moderating variable effect occurs when the presence of a third independent (moderating) variable causes the relationship between an independent variable and a dependent variable to change depending on the value of the moderating variable (Hair, Black, Babin, and Anderson, 2009). In this research, the non-metric, categorical variable, group membership (that is, nascent entrepreneur group *versus* non-entrepreneur group), was examined as a moderating variable. This section discusses the results of these analyses.

In terms of the relationships that appear to be dependent upon group membership and therefore what relationships are critical to effecting business start-up behaviour for nascent versus non-entrepreneurs, the moderating hypotheses results appearing in Exhibit 6.4 provide some insights. As can be seen, there are four variable relationships that are significant that are moderated by group membership. All four of these relationships are significant in the nascent entrepreneur model but not in the non-entrepreneur model. Thus, these are distinguishing relationships between nascent and non-entrepreneurs in this research.

- Internal Values → Entrepreneurial Attitude at $T_1$
- External Values → Entrepreneurial Attitude at $T_1$
- Internal Values → Business Start-Up Behaviour at $T_3$
- Entrepreneurial Intention at $T_3$ → Business Start-Up Behaviour at $T_3$

**Exhibit 6.4: Significant Moderating Variable Relationships**

These results suggest that membership of a particular group type (that is, whether membership is nascent entrepreneur or non-entrepreneur) has a moderating effect on the relationships identified depending on what group a participant is in (that is, the relationships between the variables identified change significantly depending on group membership). Thus, these four relationships appear key to understanding business entrepreneur start-up behaviour by individuals in a South African, developing country, socio-economic disadvantaged context as reflected in this research. Discussion of the identified relationships follows.

First, the entrepreneur group demonstrated significantly greater internal and external values than the non-entrepreneur group. Nascent entrepreneurs/entrepreneurs - more so than the non-entrepreneur group - were characterised by strong internal values (a belief in oneself) and strong external values (the ability to relate to others) – though nascent entrepreneur external values were not as strong as their internal values. Having strong internal and external values appears to be essential for those individuals in this research who wanted to start businesses.

Second, there was a strong relationship between internal values and entrepreneurial attitude at $T_1$ and external values and entrepreneurial attitude at $T_1$ for the nascent entrepreneur group. Both internal values and external values influence nascent entrepreneur entrepreneurial attitude at $T_1$ – at the commencement of the nascency process in this research. Thus, being able to believe in oneself and having the ability to network and interact with others to help solve problems in moving the business forward at an early stage in the nascency process appears to be extremely important in developing an entrepreneurial attitude. This is consistent with existing theory that supports a relationship between values and attitude.

This relationship, however, only existed for the nascent entrepreneur group – it did not exist for the non-entrepreneur group which is puzzling as the absence of this relationship contravenes existing theory. No explanation can be provided for this. Also, puzzling was that the values-entrepreneurial attitude relationship did not exist at $T_2$ or $T_3$ for the nascent entrepreneur group. No explanation can be provided for the absence of this relationship either. However, it is apparent from the theory and this research that values are more unwavering than attitudes and are less susceptible to change. Since values are related to attitude, they provide the basis for more steady estimates of behaviour. Thus, perhaps a more stable approach to differentiating entrepreneurs from non-entrepreneurs is to use values *and* repeated entrepreneurial attitude measures.

Third, two factors appeared to have a significant impact on business start-up behaviour: internal values and entrepreneurial intention at $T_3$. The importance of internal values influencing business start-up behaviour can be seen when this relationship is removed from the model. When this occurs, the amount of business start-up variance explained for the nascent entrepreneur group drops from 42% to 28% (but remains the same as previously at 3% for the non-entrepreneur group). Thus, internal values – much more than external values - are important in effecting business start-up behaviour and contribute 14% toward this (42% - 28% = 14%). Thus, having an inward looking strength – a belief in self – is paramount to effecting business start-up.

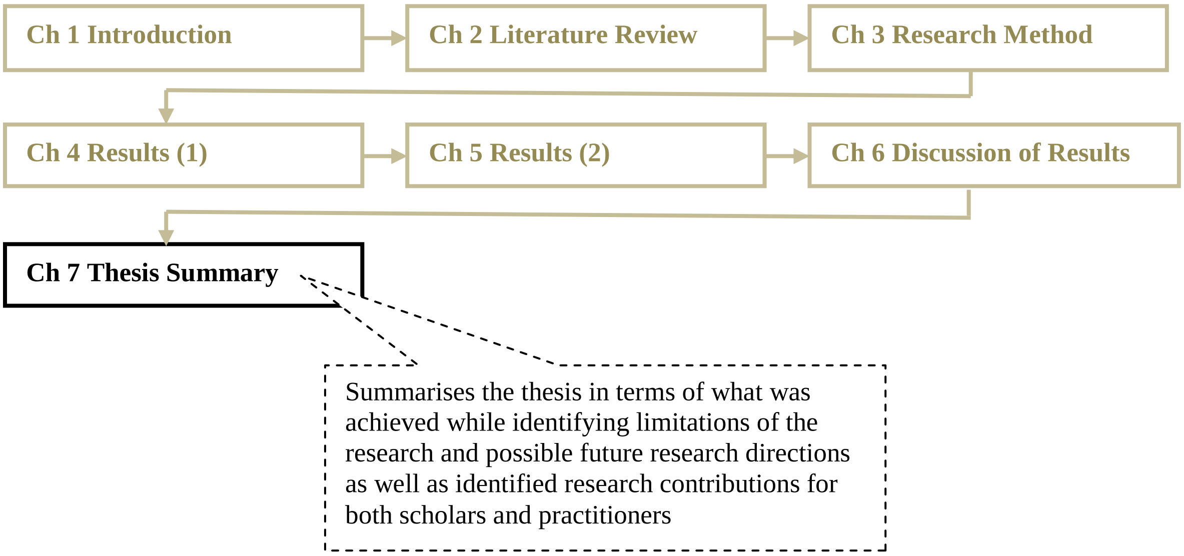
Fourth, entrepreneurial intentions *in the short term* at $T_3$ also were important in contributing to business start-up behaviour at $T_3$. This is consistent with theory that supports the notion that intentions influence our behaviour. Thus, having an intention to start a business at $T_3$ is related to starting a business at $T_3$. Note, however, that there was no relationship between entrepreneurial intention and business start-up behaviour at either $T_1$ (4.5 years prior to $T_3$) or $T_2$ (3.5 years prior to $T_3$). This provides an important caveat for the intention-behaviour relationship. This is that there needs to be close time proximity between intention and behaviour (at least, in so far as it applies in an entrepreneurial context) if intention is to be a predictor of behaviour. However, although $T_1$ and $T_2$ entrepreneurial intentions did not directly influence business start-up behaviour, there was an indirect effect with entrepreneurial intention at $T_1$ influencing entrepreneurial intention at $T_2$ which, in turn, influenced entrepreneurial intention at $T_3$ … which, in turn, influenced business start-up behaviour at $T_3$. This fits with Ajzen's (1988, 1991) theory of planned behaviour … intention may not be a good predictor of behaviour where intervening events can alter intentions.

## 5.0 Chapter Summary

Chapter 6 discusses the research results and what these may mean. The Chapter first examined the *mean* similarities and differences of the model variables based on the results reported in Chapter 4. There were significant differences between the nascent and non-entrepreneur groups in terms of these variables. Discussion then focused on the key *relationships* among these variables by examining the moderating variable hypothesis results reported in Chapter 5. Although the model achieved good fit for both the nascent and non-entrepreneur groups, the model was more effective with the nascent entrepreneur group in that it explained 42% of the business start-up behaviour for the nascent entrepreneur group (and only 3% of this behaviour for the non-entrepreneur group).

The research builds upon prior opportunity-focused entrepreneur research undertaken and extends it to nascent entrepreneurs in a socially and economically disadvantaged situation while contrasting the nascent entrepreneur structural model with the same model examined in a non-entrepreneur context. Although previous research identified entrepreneurial attitude to be effective in discriminating between existing (opportunity-focused) entrepreneurs and non-entrepreneurs, this research identified a potential consistency problem in measuring entrepreneurial attitude over time. Although, in this research, entrepreneurial attitude was successful in discriminating between necessity and non-entrepreneurs on two of the three occasions that measures were taken, it failed to do so on a third measurement occasion immediately after both groups were exposed to the entrepreneurship training program. Values, however, were stable across the duration of the 4.5 year study with internal and external values significantly associated with the entrepreneurial attitudes of the entrepreneur group members. Thus, it is recommended that a combination of both personal values measures (particularly internal values measures) and repeated measures of entrepreneurial attitude suitably spaced over time may be useful in distinguishing nascent entrepreneurs from non entrepreneurs in socially and economically disadvantaged South African situations.

# Chapter 7
# Thesis Summary




## 1.0 Introduction

Chapter 7 provides a summary of the research undertaken as described in the thesis. In addition, it identifies limitations associated with the research, possible future research directions, and the contributions the research has made toward theory and practice.

## 2.0 Summary of Research

This thesis reports upon the research undertaken. The variables of interest in this research were personal values, entrepreneurial attitude, entrepreneurial intention, and business start-up behaviour. The conceptual model that underpinned the inter-relationships among these variables was derived from Ajzen's (1991) theory of planned behaviour.

The primary aim of the research was to answer the following research question: To what extent do values, entrepreneurial attitude, and entrepreneurial intention contribute toward business start-up behaviour in a socially and economically disadvantaged South African context. To answer this question, the research involved examining two groups of individuals over time. One group identified themselves as nascent entrepreneurs who wanted to start a business in the foreseeable future. The other group identified themselves as non-entrepreneurs who wanted to find a job and not start a business. Both groups did not have jobs immediately prior to or during the training component of the project.

The research design involved a longitudinal repeated measures study with measurements undertaken at three points in time: $T_1$ (baseline – immediately prior to the commencement of the entrepreneurship training and mentoring intervention program), $T_2$ (one year after baseline during which the one year intense entrepreneurship training and mentoring program was conducted), and $T_3$ – end-of-study (which was 3.5 years after $T_2$). The overall duration of the research was 4.5 years.

By taking measurements of these variables over time using repeated measures (whereby an individual's responses are collected and analysed at each point in time to enable comparisons over time), insights were provided into the behaviour of these variables that are more difficult to observe when using cross-sectional research methods. Temporal divisions (that is, allowing for a suitable time period) between the collections of data on these variables is important if causality is to be determined. If data is not collected longitudinally, then "we (can) not rule out the possibility of reversed causality" (Davidsson, 2005, p. 41). In this regard, the research results provided methodological insights for researchers to consider when examining psychological variables as well as results relevant specifically to the entrepreneurship domain that are relevant for both scholars and practitioners.

## 3.0 Research Limitations and Future Research Directions

Although this research had its "strong points", including its longitudinal repeated measures design and the use of both an "experimental group" (nascent entrepreneur group) and a "control group" (non-entrepreneur group), there were also some limitations associated with the research. These did not necessarily negate the results – they were *not* regarded as fatal flaws as such – but future researchers who want to build upon and extend this research may want to keep these in mind and look to overcome these limitations in future studies. Some of the more pertinent limitations are discussed below.

*First*, by design, the research was restricted to South Africa. South Africa is a wealthy but developing country that reflects, at one end of the spectrum, an affluent professional class of people. At the other end, there is considerable poverty with high unemployment, poor living conditions, and associated social and health related ills. The focus of this research was on those individuals who tended to be located more toward the socially and economically disadvantaged end of the spectrum. All were black South Africans. As such, although the research focus is not a weakness, the research results are not necessarily generalizable to other countries – particularly developed countries where poverty is more the exception.

- *Overcoming the "limitation" in future research*: Future research of this nature should be undertaken in both developed and developing countries where the nature of the country (that is, whether it is developed or developing) could form the basis for a moderating hypothesis variable to examine to what extent "country type" – developed or developing – and nation culture influences the results.

*Second*, related to the first limitation, the nascent entrepreneur group members were "necessity entrepreneurs" … they were looking to establish businesses out of necessity – because of a lack of social security support. Thus, although there is a growing appreciation that in many developing countries, necessity entrepreneurship is a way of life and perhaps the dominant form of entrepreneurship when examining all countries in the world (considering that the European and US populations account for only 12% of the world's population (Henrich, Heine, and Norenzayan, 2010)), the results are not necessarily generalizable to opportunity focused entrepreneurs who set up businesses because they want to (not because they have to).

- *Overcoming the "limitation" in future research*: Future research could focus on opportunity entrepreneurs and/or have a comparative focus whereby both necessity and opportunity entrepreneur groups are included to evaluate similarities and differences between the two groups.

*Third*, the sample was not randomly selected from the population that may have led to sample bias. However, random sampling is difficult to achieve with the target population of interest for at least two reasons … First, there is an ongoing influx of foreign nationals (for example, from Zimbabwe) and South African citizens from regional areas who travel and who move in and out of township communities looking for work and a new and improved way of life. Thus, the population in these communities is dynamic and it is difficult, if not impossible, to determine what the population actually is. For example, the World Bank places the population of South Africa to be 49,991,300 (World Bank, 2011); however, conversations with various local South Africans suggest that the population is closer to 60 million people when illegal immigrants are taken into consideration. This research, however, was limited to black South African nationals. Second, even if the population was stable (and in most townships, there is a stable core), it is difficult to reach every individual since most people use mobile phones (as such there is no fixed-line telephone directory) and, in some cases, residents of these communities are "squatters" who did not necessarily purchase the "plot" of land they are living on (it may not have a street address *per se*). To overcome this problem, widespread promotion of the program and the provision of a stipend to make it attractive for people to apply was instituted; however, it is possible that there were nascent entrepreneurs in the target population who did not participate in the program (either because they had not heard of the program or because they had heard of the program but consciously chose not to).

It is possible that these people may have had values, entrepreneurial attitude, and/or entrepreneurial intention profiles different than the sample used in this research.

- *Overcoming the limitation in future research*: This is a difficult limitation to overcome and, to be honest, I do not know if you can. I believe that what was done was the best that could be achieved given the socially and economically developing country context. I have no suggestions on how to improve sampling in this type of environment in any future studies. Presentations by my co-authors of papers that have come from my research at the Babson College Entrepreneurship Research Conferences during the 2009 - 2011 period provided no answers from the audience when this issue was raised during the presentations.

*Fourth*, data was collected on a number of variables (but were not examined in this thesis) that could form the basis for moderating variable hypotheses. One potential moderating variable that may be important to consider is *gender*. In this thesis document, both male and female data was combined in the analysis – it was not examined separately. Yet, it may be that gender type has a significant influence on either the variables of interest and/or their inter-relationships (see, for example, Hindle, Klyver, and Jennings, 2009; Lindsay and Lindsay, 2012; Lindsay, Lindsay, Kropp, and Jordaan, 2011). Another potential moderating variable may be whether the participant's business was planned to be a *family business* or not (see for example, Lindsay, Lindsay, Kropp, and Jordaan, 2011). Examining these potential moderating hypotheses based on theoretical considerations, may provide additional insights that the current analysis was unable to provide.

- *Overcoming the limitation in future research*: <u>Based on underlying theoretical considerations</u>, further analysis of the data should be undertaken to examine to what extent, other potential moderating variables such as gender (male versus female) and business type (family versus non-family) influence the results.

*Fifth*, there are possible threats to internal validity (threats to external validity – generalization of the results – have previously been dealt with). Internal validity involves whether an experimental treatment/condition makes a difference and whether adequate evidence is available to support a particular claim. Although threats to internal validity are a concern for all research designs, there are some that are particularly pertinent to a longitudinal study. These internal threats include "history" effects, "maturation" effects, and "test-retest" effects.

*History* relates to specific events that may have occurred between particular measurements taken (say, between $T_1$ and $T_2$ or $T_2$ and $T_3$) that may have affected how the participants responded to the survey scale questions they completed after an event occurred. Although there may have been *wide reaching* historical events occurring between data collection points that could affect participants (for example, events involving the economy or the community as a whole), presumably these events would have affected both the nascent and non-entrepreneur groups in a similar manner. To this extent, the effects would be included in the results of both groups and so group comparisons remain possible over time. In this regard, the entrepreneurship training and mentoring intervention was deliberately included as a specific event that would affect both groups. Although, cause and effect cannot be attributed, there were some significant effect differences immediately after the training and mentoring intervention at $T_2$ and these were worthy of reporting since they were fundamental to the research questions asked in this research. To the extent that *localized* historical events affected individual participants in this research (for example, death of a loved one or participant illness or trauma), these are more difficult to deal with in isolating the effects on the data collected. However, because these events would have happened randomly on an ad hoc individual basis, the effects of such events, would have had a minimal effect.

*Maturation* affects participant processes as a function of the duration of time (participants may improve over time because of their increasing maturity). In this research, participants aged and matured over the 4.5 year duration of the project. To this extent, their increasing maturity may have affected their responses at subsequent time periods when the data was collected. To this extent, the responses at $T_2$ and $T_3$ may have been different from that at $T_1$ – simply because the participants were more mature at these points. However, there are two issues to consider here. First, both the nascent and non-entrepreneur groups aged at the same rate and although there will be individual differences in how people age and mature, as a whole, these affected both groups making group comparisons possible. Second, and importantly, invariance testing was conducted between and across groups to ensure that both groups and each group over time was drawn from the same population and interpreted the scale questions in a similar manner at each time point. The invariance testing revealed no significant differences either between groups or within groups over time.

*Test-Retest effects* may occur when a participant takes the same test two or more times. The concern is that the responses on the same subsequent test may have been influenced by taking the test previously. In this research, the same scale measurements were taken at three different points in time – $T_1$, $T_2$, and $T_3$. However, one year had lapsed between $T_1$ and $T_2$

and 3.5 years had lapsed between $T_2$ and $T_3$. Thus, although it is possible that participant responses at $T_2$ and $T_3$ were affected by having previous knowledge of the instrument, the time duration between participants completing the instruments was considerable. As such, it is anticipated that any such effects would be negligible.

- *Overcoming the limitation in future research*: In a longitudinal study of this nature, there is little that can be done to overcome the threats to internal validity identified. The best that can be done is that the researcher is aware of such threats and acknowledges these when reporting the results to draw attention to the potential issues that may have affected the results and any conclusions drawn.

*Sixth*, there are inherent limitations in any longitudinal study in terms of our knowledge of the underlying function for the population of interest as this comes from a limited number of observations (in the case of this research, there were three sets of observations … $T_1$ - baseline, $T_2$ – one year after baseline, and $T_3$ – end-of-study that was 3.5 years after $T_2$). Thus, we cannot be certain, for example, that had other points in time been selected for data collection, the underlying trend would have been the same. In addition, is it valid to infer a continuous function between the three points that were used for analysis purposes in this research? The only way to answer these questions is to introduce multiple data collection points that are temporally closely spaced but this is impractical and it creates problems for internal validity. Thus, we need to be careful about any conclusions made about trends outside of the relevant range which in this study was between baseline and the end-of-study.

- *Overcoming the limitation in future research*: From a practical perspective, researchers need to be aware of research design limitations when it comes to interpreting the results. Although additional data collection points would have been desirable in this research, there were cost and time constraints that made this impossible. Future repeated measure studies of this nature, however, may want to consider building in four data collection points to better understand the underlying functional structure of the variables of interest and this is particularly desirable where quadratic variable functions are expected.

## 4.0 Research Contributions

The research makes a contribution at both the theoretical and applied levels. These contributions are discussed below.

## 4.1 Contribution to Theory

The research makes a theoretical contribution in a number of ways. First, the repeated measures longitudinal nature of the research allowed insights to be achieved that are not possible with cross-sectional studies. Humans are complex organisms that are susceptible to change – both from internal and external pressures and influences (as well as due to the passage of time). With a focus on the particular variables of interest in this research, the dynamism of the entrepreneurial attitude and entrepreneurial intention variables could be observed. However, even the observation of the static nature of participants' personal values over time was invaluable and this acted as a stark contrast against the other two changeable variables.

Second, whereas many (cross-sectional) studies *either* focus on entrepreneurs *or* nascent entrepreneurs, this research was able to observe and track how nascent entrepreneurs transitioned from simply having an idea or an intention to start a business to their actually starting businesses and becoming entrepreneurs. A part of this process involved observing how different variables contributed toward this process. With 42% of the business start-up variance explained for the nascent entrepreneur group, values, entrepreneurial attitude, and entrepreneurial intention have a significant role to play in influencing business start-up behaviour. However, of course, a burning question is what about the other 58% of variance that was not explained in this research. This needs to form the focus of subsequent studies into what other variables influence business start-up behaviour and to what extent do environmental influences affect business start-up.

Third, because two groups were used in the research - nascent and non-entrepreneur – similarities and differences between the two groups could be observed at each point in time across the variables (and their inter-relationships) of interest. Thus, although the nascent entrepreneur group were of key interest, having the non-entrepreneur group facilitated contrast.

Fourth, whereas many prior studies have focused on opportunity-oriented entrepreneurs, this research examined necessity-based entrepreneurs. This is an important group to gather information on as they represent a sizeable group of individuals in South Africa and indeed the rest of the world.

As a result, the approach taken in this research and the results identified have contributed toward entrepreneurship theory development by providing a better understanding of the nature of attempting to measure psychological variables (that may be changeable over time) as well as the specific results that were identified in this research that contribute toward filling in gaps in the literature.

### 4.2 Contribution to Practice

The research also makes a contribution at the applied level by providing insights to practitioners and policy makers that may readily be applied in stimulating entrepreneurial activity. From a practitioner perspective, it seems that entrepreneurship training may have the best results if delivered to individuals who already have an entrepreneurial attitude prior to the training process. However, because entrepreneurial attitude is changeable and values appear to be relatively stable, both variable types need to be considered when focusing on those who may be more inclined to start businesses. Thus, scarce resources should be directed toward attracting nascent entrepreneurs who have positive entrepreneurial attitudes and higher internal values. Practitioners and/or policy makers may want to consider introducing a screening process that identifies such suitable candidates. The greater nexus between entrepreneurial intention and business start-up occurred when there was a closer time duration between the two. Thus, if policy makers are interested in increasing business start-ups then they need to identify (and train) and support those nascent entrepreneurs who are looking to establish businesses within the short term.

## 5.0 Chapter Summary

Chapter 7 summarises the research reported in this thesis. In so doing, it presents the key findings, research limitations, and future directions other researchers may choose to follow to build upon the results of this study. Although there were certain limitations associated with the research, none are regarded as being "fatal flaws" that negate the results obtained. The results provide a solid foundation upon which other studies can build.

The Chapter also provides insights into the contributions the research makes to current theory in terms of how it improves our understanding of nascent entrepreneur behaviour – particularly for those nascent entrepreneurs who need to establish businesses to generate an income because they do not have and cannot find a job. Contributions of the research from an applied perspective were also presented in terms of what the research results mean for practitioners and policy makers regarding considerations for improving the returns on entrepreneurship training programs by selectively targeting individuals who are most likely to start businesses.

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# Appendix 1
# Letter from Training Organisation

5 January, 2004

**To whom it may concern**

**Granting of rights to data collected by, and owned by, The Entrepreneurship Incubator (Pty) Ltd**

I advise that all data collected during the January 2004-December 2008 period (both quantitative and qualitative) for the South African longitudinal study that involves evaluating the effects of participants' enrolment in an *entrepreneurship training, mentoring, and incubating program* (hereafter referred to as "the training program" or "the program") was collected by, and is owned by, The Entrepreneurship Incubator (Pty) Ltd (here after referred to as "the Company"). The data was collected in an ethical manner by the Company and participants participated in the data collection process on a voluntary basis. The training program was developed by and was delivered by the Company and it owns all intellectual property rights associated with the program.

Although the Company owns the data and any rights associated with it, the Company grants Wendy Lindsay unconditional access to this data and the rights to analyse the data for the purposes of her PhD research on the understanding that she makes the results of her analysis available to the Company. The Company may use these results to improve any future entrepreneurship training programs that the Company engages in. The Company also unconditionally grants Wendy Lindsay the rights to publish the results of her research in her doctoral thesis, academic journal, book, magazine, newspaper, web site, and/or any other media form that she deems suitable.

Regards,

**Rea Bachtis**
Executive Officer

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# Appendix 2
# Research Documents Provided to Study Participants

## Information Sheet

The Entrepreneurship Incubator (Pty) Ltd

**A research study about how entrepreneurship training affects nascent entrepreneurs**

The purpose of this study is to advance our understanding of the effects of an entrepreneurship training, mentoring, and incubation program on the behaviour of those participating in the program. The study is longitudinal and participants will be asked to complete a questionnaire three times: prior to commencement of the program; at the end of the formal training and mentoring; and subsequently after a suitable period has lapsed after the training and mentoring has been completed.

If you consent to participate, you will be provided with a questionnaire for you to complete. It is expected that the questionnaire will take around 20 minutes to complete.

You may also be asked to participate in a discussion forum and/or a face-to-face interview(s) during and/or after you have completed the program.

Benefits flowing from the study include making improvements to future entrepreneurship training and mentoring programs for those intending to start businesses based on the results and feedback received.

The results of this study will be published in academic and professional journals. However, your privacy, anonymity, and confidentiality will be assured. All the information you provide will be stored securely and will be accessible by the research team.

You are free to withdraw from the study at any time.

# CONSENT FORM

The Entrepreneurship Incubator (Pty) Ltd

1. I, ……………………………………………………………… *(please print name)*

   consent to take part in the research project entitled: "A research study about how entrepreneurship training affects necessity entrepreneurs"

2. I acknowledge that I have read the attached Information Sheet entitled: "A research study about how entrepreneurship training affects necessity entrepreneurs"

3. I have had the project, so far as it affects me, fully explained to my satisfaction. My consent is given freely.

4. Although I understand that the purpose of this research project is to assist entrepreneurs, it has also been explained that my involvement may not be of any benefit to me.

5. I have been given the opportunity to have an independent third party present while the project was explained to me.

6. I have been informed that, while information gained during the study may be published, I will not be identified.

7. I understand that I am free to withdraw from the project at any time.

9. I am aware that I should retain a copy of this Consent Form, when completed, and the attached Information Sheet.

   ………………………………………………………………………………………………...

   *(signature)* *(date)*

**WITNESS**

I have described to ……………………………………………………….. *(name of participant)*

the nature of the research to be carried out. In my opinion she/he understood the explanation.

Status in Project**: Observer**

Name:

………………………………………………………………………………………………...

*(signature)* *(date)*

# Appendix 3
# Questionnaire

The results of this Questionnaire are strictly confidential; information about individuals will not be disclosed. There are no right or wrong answers, just tell us what you think.

***Thank you for agreeing to participate in this survey.***
The Entrepreneurship Incubator (Pty) Ltd

**A:** Please answer the following questions about yourself:

1. What is your gender?
   - ☐ 1:Female ☐ 2: Male

2. What is your age? ………………Years

3. What is the <u>highest</u> education level you achieved?
   - ☐ 1: Primary School
   - ☐ 2: Secondary (High) School
   - ☐ 3: Technical or Trade Qualification
   - ☐ 4: A Certificate after high school
   - ☐ 5: A Diploma after high school
   - ☐ 6:Undergraduate Degree
   - ☐ 7:Postgraduate Degree
   - ☐ 8:Other (specify)______________________

4. What is your <u>current</u> employment status?
   - ☐ 1: I have a full time job
   - ☐ 2: I have an ongoing part time job
   - ☐ 3: I get casual work whenever I can
   - ☐ 4: I am self employed
   - ☐ 5: I am unemployed

5. If you are not working, how long have you been unemployed? ______________________________

6. Have you ever started a business or bought into a business previously?
   - ☐ 1:Yes ☐ 2: No

7. Do you intend to <u>actually start</u> a business within the foreseeable future?
   - ☐ 1:Yes ☐ 2: No

8. How likely is it that you will <u>start</u> a business within the foreseeable future?

| Extremely Unlikely | | | | | | Extremely Likely |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

9. Have you started a business since the program commenced?
   - ☐ 1:Yes ☐ 2: No

10. To what extent have you started a business since starting this program? (a “1” means you have not started a business at all; “7” means that your business is fully operational, and numbers rated in between (that is, the “2” to “6” range) provide insights into how operational your business is at this point in time – to what extent it is partially operating or not.)

| Completely Unoperational | | | | | | Completely Operational |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**B:** *Please answer the following questions about yourself.*

The following is a list of things that some people look for or want out of life. Sometimes you find that you have to give up a little of something important because something else is most important to you. Please study the list carefully and then rate each thing on how important it is in your daily life where "1" = important to me and "9" = extremely important to me.

| | | **Important to me** | | | | | | | | **Extremely Important to me** |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Sense of Belonging (to be accepted and needed by friends, family, and community) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2. | Excitement (to experience stimulation and thrills) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 3. | Warm Relationships with Others (to have close companionship and intimate friendship) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4. | Self-Fulfilment (to find peace of mind and to make the best use of my talents) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 5. | Being Well-Respected (to be admired by others and to receive recognition) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 6. | Fun and Enjoyment in Life (to lead a pleasurable happy life) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 7. | Security (to be safe and protected from misfortune and attack) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 8. | Self-Respect (to be proud of myself and confident of who I am) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 9. | A Sense of Accomplishment (to succeed at what I want to do) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

**C:**

Indicate how much you agree with each of the following statements by circling a number between "1" and "10" where "1" indicates that you "strongly disagree" with the statement and "10" indicates that you "strongly agree" with the statement. A "5" indicates you only slightly disagree and a "6" shows only slight agreement. Work as quickly as you can. Don't stop to think too deeply about any one question just mark down your first thought. Please answer all questions. Remember "1" = Strongly Disagree and "10" = Strongly Agree.

| | | Strongly Disagree | | | | | | | | | Strongly Agree |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | I prefer to work in an environment where there are few risks required and I am certain of what is expected of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2. | I would like a job in a new organisation in which the rewards may be high but the risks are high also. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 3. | I rarely put myself in positions in which I might lose something important to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 4. | 1-My focus would be to identify what a customer needs and wants without first getting a lot of instruction. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5. 2-In my job or in social or community situations, I have helped identify new ways of performing the things that we must do. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 6. The way I see my future is dramatically different from the way things are now. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 7. I don't mind taking chances with things that are important to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 8. 1-I believe I can identify what a customer needs to make them satisfied. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 9. 1-I do not hesitate to make the changes that I think are needed in my workplace, social, or community setting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 10. I see many ways that we can do things different in my workplace, social, or community setting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11. I think I should get a job rather than set up a business because there is less uncertainty with this. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 12. If I feel that the chance of failure is high, I would not start my own business. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 13. 3-I like talking to people to find out how I could provide better services. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 14. 3 I would enjoy finding new ways to better meet the needs of customers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 15. I would like to interact with customers so I could get their input on services they need. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 16. I like to take chances with my future career choices 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 17. There are career moves I would be reluctant to make because they pose risk to my future security. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 18. I prefer a sense of achievement over just getting a financial gain (making money). | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Your Name: ………………………………………………………………………………………………………

**Thank you for completing this survey**

# Appendix 4
# Results of Values One-Factor Congeneric Measurement Model Analyses at $T_2$ and $T_3$

## 1.0 Introduction

Appendix 4 presents the results of the one-factor congeneric measurement model analyses for the Values construct at $T_2$ and $T_3$ for both the Nascent Entrepreneur and Non-Entrepreneur Groups. Chapter 4, the *Results (1) – Preliminary Analyses, Measurement Models, and Invariance Tests Chapter*, presents the Values one-factor congeneric measurement model analyses results for $T_1$.

Because there were no significant changes in the means of the Values construct over the time period covered by $T_1$, $T_2$, and $T_3$, for simplicity purposes, only the $T_1$ Values construct data was used in the complete structural model (the $T_2$ and $T_3$ data was not used as it was not significantly different to the $T_1$ values data). For completeness purposes, however, the $T_2$ and $T_3$ Values one-factor congeneric measurement model results are provided in this Appendix rather than "clutter up" Chapter 4.

## 2.0 *Nascent Entrepreneur Group* One Factor Congeneric Models

This section presents the results of the analyses for the Nascent Entrepreneur Group one factor congeneric measurement models for Values at $T_2$ and $T_3$.

### 2.1 External Values @ $T_2$ – *Nascent Entrepreneur Group*

Exhibit 0.1 provides an overview of the one factor congeneric measurement model for the construct, External Values at $T_2$ for the Nascent Entrepreneur Group. There are four indicator items (variable names appear in brackets):

- Sense of Belonging (to be accepted and needed by friends, family, and community) (v1extbe2)
- Warm Relationships with Others (to have close companionship and intimate friendship) (v3extre2)
- Being Well-Respected (to be admired by others and to receive recognition) (v5extre2)
- Security (to be safe and protected from misfortune and attack) (v7extse2).

The latent variable, External Values (measured at $T_2$), is a function of the observed variables: v1extbe2, v3extre2, v5extre2, and v7extse2.

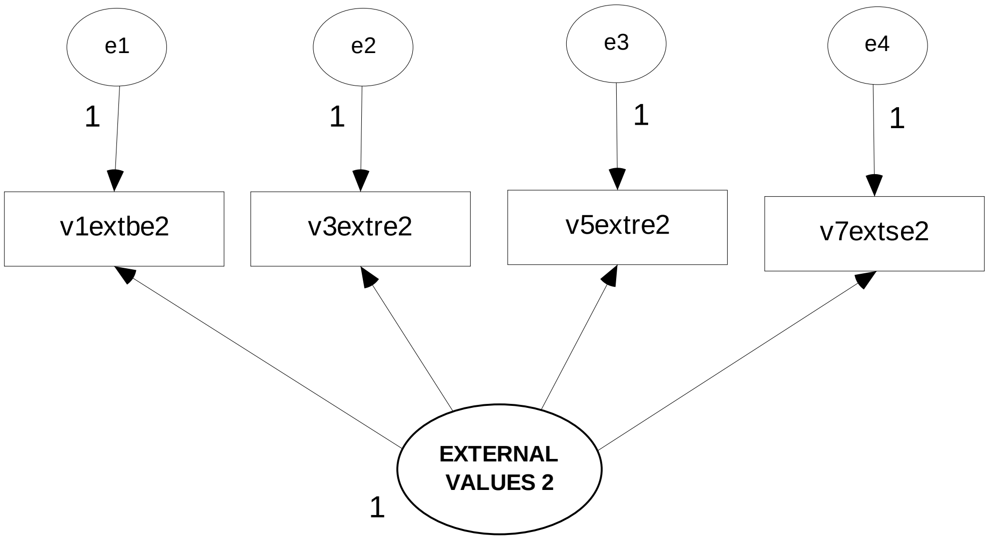


**Exhibit 0.1: One Factor Congeneric Model for External Values at $T_2$**
***(Nascent Entrepreneurs)***

Exhibit 0.2 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for External Values at $T_2$. The sample correlations ranged from a low of 0.569 to a high of 0.630. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | v1extbe2 | v3extre2 | v5extre2 | v7extse2 |
|---|---|---|---|---|
| v1extbe2 | 2.275 | | | |
| v3extre2 | 1.335 | 2.314 | | |
| v5extre2 | 1.274 | 1.197 | 2.203 | |
| v7extse2 | 1.509 | 1.354 | 1.273 | 2.521 |

Condition number = 7.359
Eigenvalues
6.312 1.087 1.056 .858
Determinant of sample covariance matrix = 6.217

**Sample Correlations (Default)**

| | v1extbe2 | v3extre2 | v5extre2 | v7extse2 |
|---|---|---|---|---|
| v1extbe2 | 1.000 | | | |
| v3extre2 | .582 | 1.000 | | |
| v5extre2 | .569 | .530 | 1.000 | |
| v7extse2 | .630 | .561 | .540 | 1.000 |

Condition number = 7.393
Eigenvalues
2.707 .477 .450 .366

**Exhibit 0.2: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for External Values at $T_2$**
***(Nascent Entrepreneurs)***

Exhibit 0.3 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for External Values at $T_2$. As can be seen from the Regression Weights, all of the four observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the External Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.709 to 0.806. These represent the correlations between each item and the External Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.503 to 0.650.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v3extre2 | <--- | EXTERNAL_VALUES1 | 1.054 | .097 | 10.846 | *** | b |
| v1extbe2 | <--- | EXTERNAL_VALUES1 | 1.156 | .099 | 11.685 | *** | a |
| v5extre2 | <--- | EXTERNAL_VALUES1 | 1.000 | | | | |
| v7extse2 | <--- | EXTERNAL_VALUES1 | 1.167 | .103 | 11.366 | *** | c |

**Standardized Regression Weights: (Default - Default model)**

| | | | Estimate |
|---|---|---|---|
| v3extre2 | <--- | EXTERNAL_VALUES1 | .729 |
| v1extbe2 | <--- | EXTERNAL_VALUES1 | .806 |
| v5extre2 | <--- | EXTERNAL_VALUES1 | .709 |
| v7extse2 | <--- | EXTERNAL_VALUES1 | .773 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v1extbe2 | .650 |
| v3extre2 | .531 |
| v5extre2 | .503 |
| v7extse2 | .597 |

**Exhibit 0.3: Scalars for External Values at $T_2$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 0.4 presents the Nascent Entrepreneur Group Model Fit statistics for External Values at $T_2$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the External Values construct dimension at $T_2$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 0.482 with 2df and p = 0.786 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0058 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0. 886<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.01 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.00 | CFI > 0.95 |

**Exhibit 0.4: Model Fit Statistics for External Values at $T_2$**
**(*Nascent Entrepreneurs*)**

## 2.2 External Values @ $T_3$ – *Nascent Entrepreneur Group*

Exhibit 0.5 provides an overview of the one factor congeneric model for the construct, External Values at $T_3$ for the Nascent Entrepreneur Group. There are four indicator items (variable names appear in brackets):

- Sense of Belonging (to be accepted and needed by friends, family, and community) (v1extbe3)
- Warm Relationships with Others (to have close companionship and intimate friendship) (v3extre3)
- Being Well-Respected (to be admired by others and to receive recognition) (v5extre3)
- Security (to be safe and protected from misfortune and attack) (v7extse3).

The latent variable, External Values (measured at $T_3$), is a function of the observed variables: v1extbe3, v3extre3, v5extre3, and v7extse3.

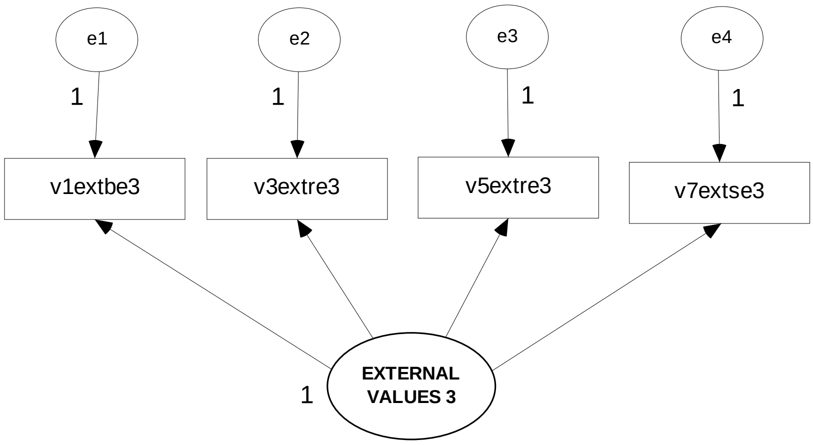


**Exhibit 0.5: One Factor Congeneric Model for External Values at $T_3$**
***(Nascent Entrepreneurs)***

Exhibit 0.6 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for External Values at $T_3$. The sample correlations ranged from a low of 0.579 to a high of 0.658. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | v1extbe3 | v3extre3 | v5extre3 | v7extse3 |
|---|---|---|---|---|
| v1extbe3 | 2.034 | | | |
| v3extre3 | 1.255 | 2.097 | | |
| v5extre3 | 1.185 | 1.161 | 1.912 | |
| v7extse3 | 1.348 | 1.224 | 1.148 | 2.060 |

Condition number = 8.217
Eigenvalues
5.692 .883 .835 .693
Determinant of sample covariance matrix = 2.907

**Sample Correlations (Default)**

| | v1extbe3 | v3extre3 | v5extre3 | v7extse3 |
|---|---|---|---|---|
| v1extbe3 | 1.000 | | | |
| v3extre3 | .608 | 1.000 | | |
| v5extre3 | .601 | .580 | 1.000 | |
| v7extse3 | .658 | .589 | .579 | 1.000 |

Condition number = 8.279
Eigenvalues
2.808 .435 .418 .339

**Exhibit 0.6: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for External Values at $T_3$**
***(Nascent Entrepreneurs)***

Exhibit 0.7 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for External Values at $T_3$. As can be seen from the Regression Weights, all of the four observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the External Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights range from 0.709 to 0.806. These represent the correlations between each item and the External Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.503 to 0.650.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v7extse2 | <--- | EXTERNAL_VALUES 2 | 1.227 | .086 | 14.325 | *** | par_1 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | 1.109 | .084 | 13.262 | *** | par_2 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | 1.216 | .080 | 15.156 | *** | par_3 |
| v5extre2 | <--- | EXTERNAL_VALUES 2 | 1.052 | .082 | 12.783 | *** | par_4 |

**Standardized Regression Weights: (Default - Default model)**

| | | | Estimate |
|---|---|---|---|
| v7extse2 | <--- | EXTERNAL_VALUES 2 | .773 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | .729 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | .806 |
| v5extre2 | <--- | EXTERNAL_VALUES 2 | .709 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v1extbe2 | .650 |
| v3extre2 | .531 |
| v7extse2 | .597 |
| v5extre2 | .503 |

**Exhibit 0.7: Scalars for External Values at $T_3$**
**(*Nascent Entrepreneurs*)**

**Model Fit**: Exhibit 0.8 presents the Nascent Entrepreneur Group Model Fit statistics for External Values at $T_3$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the External Values construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2 = 1.322$ with 2df and $p = 0.516$ | $p > 0.05$ |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0089 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0. 710<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.004 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.8: Model Fit Statistics for External Values at $T_3$**
**(*Nascent Entrepreneurs*)**

## 2.3 Interpersonal Values @ $T_2$ – *Nascent Entrepreneur Group*

Exhibit 0.9 provides an overview of the one factor congeneric model for the construct, Interpersonal Values at $T_2$ for the Nascent Entrepreneur Group. There are two indicator items (variable names appear in brackets):

- Excitement (to experience stimulation and thrills) (v2funex2)
- Fun and Enjoyment in Life (to lead a pleasurable happy life) (v6funfu2)

The latent variable, Interpersonal Values (measured at $T_2$), is a function of the observed variables: v2funex2 and v6funfu2.

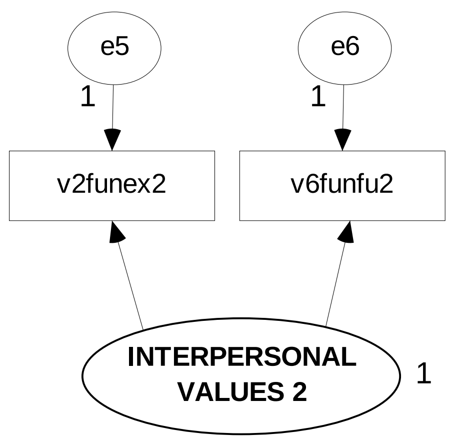


**Exhibit 0.9: One Factor Congeneric Model for Interpersonal Values at $T_2$**
***(Nascent Entrepreneurs)***

Because the Interpersonal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Interpersonal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 0.10.

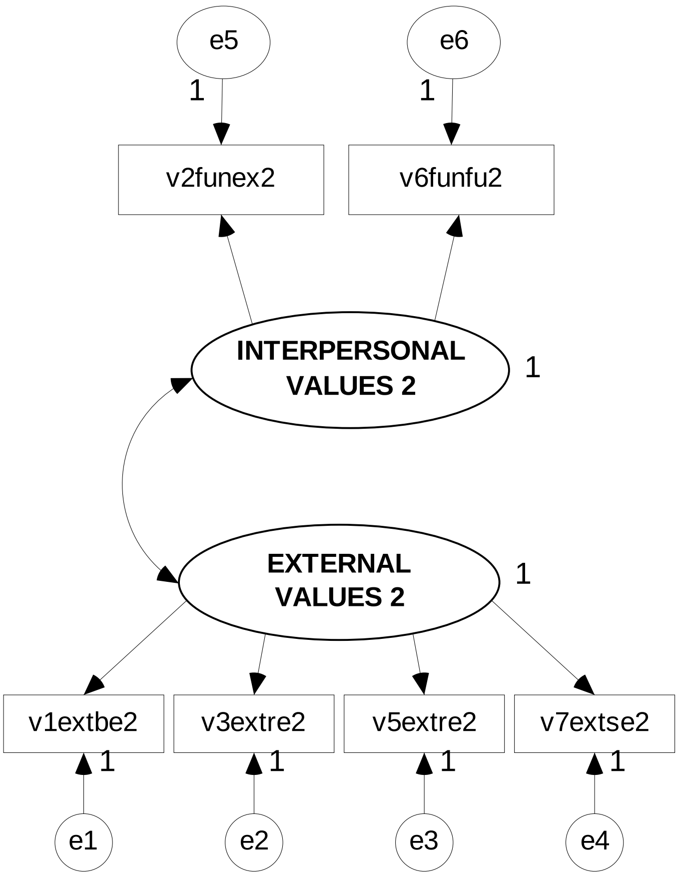


**Exhibit 0.10: Paired One Factor Congeneric Model for Interpersonal Values & External Values at $T_2$**
***(Nascent Entrepreneurs)***

Exhibit 0.11 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Interpersonal Values and External Values at $T_2$. The sample correlations between the observed items for the Interpersonal Values and External Values constructs range from 0.109 to 0.205. The correlation between the Interpersonal Values construct items was 0.636 and the correlations between the External Values construct items ranged from 0.530 to 0.630.

The Interpersonal Values value suggests that item redundancy is not a problem. The eigenvalues suggest that a two-factor solution for the model is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Interpersonal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v2funex2 | v6funfu2 |
|---|---|---|---|---|---|---|
| v7extse2 | 2.521 | | | | | |
| v1extbe2 | 1.509 | 2.275 | | | | |
| v3extre2 | 1.354 | 1.335 | 2.314 | | | |
| v5extre2 | 1.273 | 1.274 | 1.197 | 2.203 | | |
| v2funex2 | .295 | .373 | .336 | .255 | 2.494 | |
| v6funfu2 | .354 | .467 | .419 | .383 | 1.514 | 2.271 |

Condition number = 7.963
Eigenvalues 6.685 3.538 1.094 1.056 .865 .840
Determinant of sample covariance matrix = 19.837

**Sample Correlations (Default)**

| | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v2funex2 | v6funfu2 |
|---|---|---|---|---|---|---|
| v7extse2 | 1.000 | | | | | |
| v1extbe2 | .630 | 1.000 | | | | |
| v3extre2 | .561 | .582 | 1.000 | | | |
| v5extre2 | .540 | .569 | .530 | 1.000 | | |
| v2funex2 | .118 | .156 | .140 | .109 | 1.000 | |
| v6funfu2 | .148 | .205 | .183 | .171 | .636 | 1.000 |

Condition number = 8.070
Eigenvalues 2.863 1.484 .479 .450 .369 .355

**Exhibit 0.11: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Interpersonal (and External) Values at $T_2$** ***(Nascent Entrepreneus)***

Exhibit 0.12 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Interpersonal Values and External Values at $T_2$. As can be seen from the Regression Weights, the two Interpersonal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore both Interpersonal Values indicator items significantly contribute toward the variance of the Interpersonal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights for Interpersonal Values range from 0.689 to 0.924 (and External Values from 0.709 to 0.808). These represent the correlations between each item and the Interpersonal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Interpersonal Values items ranges from 0.474 to 0.854 (and for External Values 0.503 to 0.653).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | 1.052 | .082 | 12.802 | *** | par_1 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | 1.110 | .083 | 13.301 | *** | par_2 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | 1.219 | .080 | 15.240 | *** | par_3 |
| v6funfu2 | <--- | INTERPERSONAL_VALUES 2 | 1.393 | .206 | 6.759 | *** | par_5 |
| v2funex2 | <--- | INTERPERSONAL_VALUES 2 | 1.087 | .173 | 6.303 | *** | par_6 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | 1.222 | .086 | 14.272 | *** | par_7 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | .709 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | .730 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | .808 |
| v6funfu2 | <--- | INTERPERSONAL_VALUES 2 | .924 |
| v2funex2 | <--- | INTERPERSONAL_VALUES 2 | .689 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | .770 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v7extse2 | .592 |
| v1extbe2 | .653 |
| v3extre2 | .533 |
| v5extre2 | .503 |
| v2funex2 | .474 |
| v6funfu2 | .854 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 2 | <--> | INTERPERSONAL_VALUES 2 | .254 |

**Exhibit 0.12: Scalars for Interpersonal Values at $T_2$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Interpersonal Values and External Values at $T_2$ for the Nascent Entrepreneur Group is 0.254. To calculate the extent to which the Interpersonal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.13. Inspection of the structure coefficients for both the Interpersonal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| | Interpersonal Values2 | | External Values2 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre2 | 0* | 0.180 | 0.709 | **0.709** |
| v3extre2 | 0* | 0.185 | 0.730 | **0.730** |
| v1extbe2 | 0* | 0.205 | 0.808 | **0.808** |
| v6funfu2 | 0.924 | **0.924** | 0* | 0.235 |
| v2funex2 | 0.689 | **0.689** | 0* | 0.175 |
| v7extse2 | 0* | 0.196 | 0.770 | **0.770** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.13: Factor Pattern and Structure Coefficients for Interpersonal Values & External Values @ $T_2$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.14 presents the Nascent Entrepreneur Group Model Fit statistics for the Interpersonal and External Values measurement model at $T_2$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Interpersonal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Interpersonal Values construct dimension at $T_2$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 2.054 with 8df and p = 0.979 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0114 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.998<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.019 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.14: Model Fit Statistics for Interpersonal & External Values Measurement Model at $T_2$ (*Nascent Entrepreneurs*)**

## 2.4 Interpersonal Values @ $T_3$ – *Nascent Entrepreneur Group*

Exhibit 0.15 provides an overview of the one factor congeneric model for the construct, Interpersonal Values at $T_3$ for the Nascent Entrepreneur Group. There are two indicator items (variable names appear in brackets):

- Excitement (to experience stimulation and thrills) (v2funex3)
- Fun and Enjoyment in Life (to lead a pleasurable happy life) (v6funfu3)

The latent variable, Interpersonal Values (measured at $T_3$), is a function of the observed variables: v2funex3 and v6funfu3.

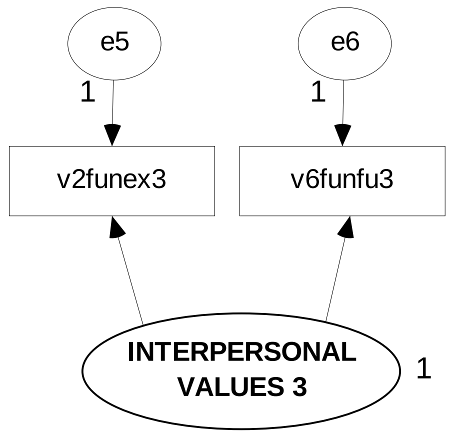


**Exhibit 0.15: One Factor Congeneric Model for Interpersonal Values at $T_3$**
***(Nascent Entrepreneurs)***

Because the Interpersonal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Interpersonal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 0.16.

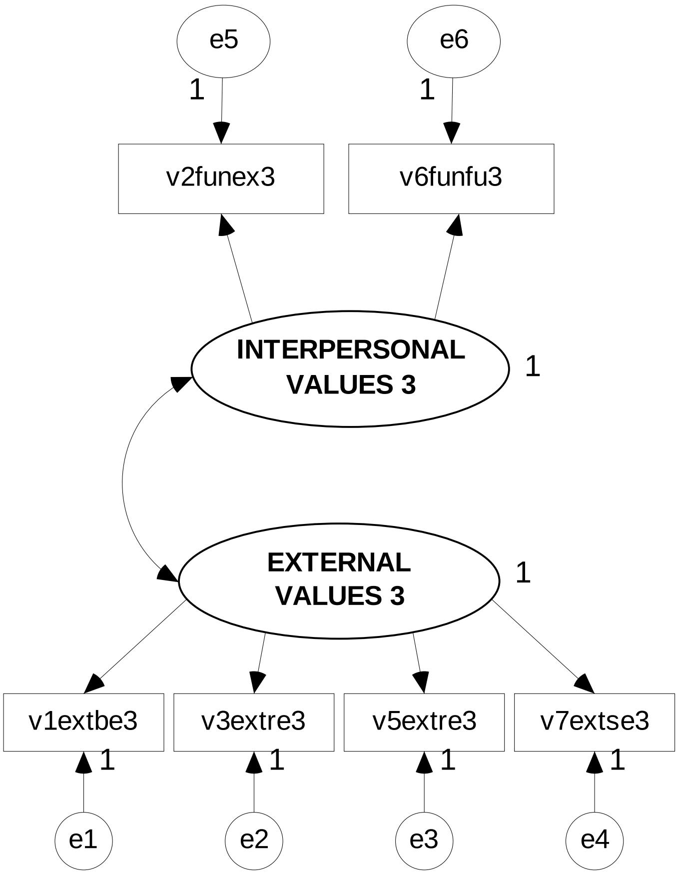


**Exhibit 0.16: Paired One Factor Congeneric Model for Interpersonal Values & External Values at $T_3$**
***(Nascent Entrepreneurs)***

Exhibit 0.17 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Interpersonal Values and External Values at $T_3$. The sample correlations between the observed items for the Interpersonal Values and External Values constructs range from 0.093 to 0.151. The correlation between the Interpersonal Values construct items was 0.617 and the correlations between the External Values construct items ranged from 0.579 to 0.658.

The Interpersonal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Interpersonal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v2funex3 | v6funfu3 |
|---|---|---|---|---|---|---|
| v7extse3 | 2.060 | | | | | |
| v1extbe3 | 1.348 | 2.034 | | | | |
| v3extre3 | 1.224 | 1.255 | 2.097 | | | |
| v5extre3 | 1.148 | 1.185 | 1.161 | 1.912 | | |
| v2funex3 | .297 | .221 | .264 | .206 | 2.562 | |
| v6funfu3 | .340 | .304 | .333 | .295 | 1.551 | 2.466 |

Condition number = 8.714
Eigenvalues 6.021 3.741 .964 .882 .832 .691
Determinant of sample covariance matrix = 11.004

**Sample Correlations (Default)**

| | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v2funex3 | v6funfu3 |
|---|---|---|---|---|---|---|
| v7extse3 | 1.000 | | | | | |
| v1extbe3 | .658 | 1.000 | | | | |
| v3extre3 | .589 | .608 | 1.000 | | | |
| v5extre3 | .579 | .601 | .580 | 1.000 | | |
| v2funex3 | .129 | .097 | .114 | .093 | 1.000 | |
| v6funfu3 | .151 | .136 | .147 | .136 | .617 | 1.000 |

Condition number = 8.610
Eigenvalues 2.906 1.521 .436 .418 .381 .338

**Exhibit 0.17: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Interpersonal (and External) Values at $T_3$** ***(Nascent Entrepreneurs)***

Exhibit 0.18 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Interpersonal Values and External Values at $T_3$. As can be seen from the Regression Weights, the two Interpersonal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore both Interpersonal Values indicator items significantly contribute toward the variance of the Interpersonal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights for Interpersonal Values range from 0.686 to 0.900 (and External Values from 0.743 to 0.816). These represent the correlations between each item and the Interpersonal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Interpersonal Values items ranges from 0.471 to 0.809 (and for External Values 0.552 to 0.666).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | 1.027 | .074 | 13.795 | *** | par_1 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | 1.091 | .078 | 14.061 | *** | par_2 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | 1.164 | .074 | 15.704 | *** | par_3 |
| v6funfu3 | <--- | INTERPERSONAL_VALUES 3 | 1.413 | .265 | 5.323 | *** | par_5 |
| v2funex3 | <--- | INTERPERSONAL_VALUES 3 | 1.098 | .215 | 5.103 | *** | par_6 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | 1.137 | .075 | 15.061 | *** | par_7 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | .743 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | .754 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | .816 |
| v6funfu3 | <--- | INTERPERSONAL_VALUES 3 | .900 |
| v2funex3 | <--- | INTERPERSONAL_VALUES 3 | .686 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | .792 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v7extse3 | .628 |
| v1extbe3 | .666 |
| v3extre3 | .568 |
| v5extre3 | .552 |
| v2funex3 | .471 |
| v6funfu3 | .809 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 3 | <--> | INTERPERSONAL_VALUES 3 | .202 |

**Exhibit 0.18: Scalars for Interpersonal Values at $T_3$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Interpersonal Values and External Values at $T_3$ for the Nascent Entrepreneur Group is 0.202. To calculate the extent to which the Interpersonal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.19. Inspection of the structure coefficients for both the Interpersonal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| Indicator Variables | Interpersonal Values3 | | External Values3 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre3 | 0* | 0.150 | 0.743 | **0.743** |
| v3extre3 | 0* | 0.152 | 0.754 | **0.754** |
| v1extbe3 | 0* | 0.165 | 0.816 | **0.816** |
| v6funfu3 | 0.900 | **0.900** | 0* | 0.182 |
| v2funex3 | 0.686 | **0.686** | 0* | 0.139 |
| v7extse3 | 0* | 0.160 | 0.792 | **0.792** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.19: Factor Pattern and Structure Coefficients for Interpersonal Values and External Values @ $T_3$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.20 presents the Nascent Entrepreneur Group Model Fit statistics for the Interpersonal and External Values measurement model at $T_3$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Interpersonal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Interpersonal Values construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 2.099 with 8df and p = 0.978 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0096 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.998<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.017 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.20: Model Fit Statistics for Interpersonal & External Values Measurement Model at $T_3$ (*Nascent Entrepreneurs*)**

## 2.5 Internal Values @ $T_2$ – *Nascent Entrepreneur Group*

Exhibit 0.21 provides an overview of the one factor congeneric model for the construct, Internal Values at $T_2$ for the Nascent Entrepreneur Group. There are three indicator items (variable names appear in brackets):

- Self-Fulfilment (to find peace of mind and to make the best use of my talents) (v4intfu2)
- Self-Respect (to be proud of myself and confident of who I am) (v8intre2)

- A Sense of Accomplishment (to succeed at what I want to do) (v9intac2)

The latent variable, Internal Values (measured at $T_2$), is a function of the observed variables: v4intfu2, v8intre2, and v9intac2.

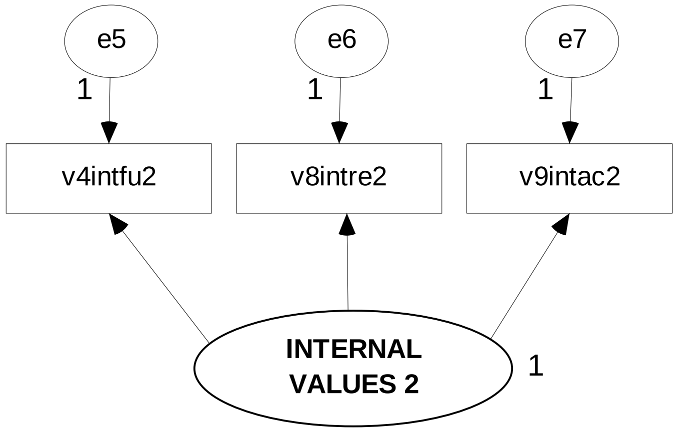


**Exhibit 0.21: One Factor Congeneric Model for Internal Values at $T_2$**
***(Nascent Entrepreneurs)***

Because the Internal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Internal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 0.22.

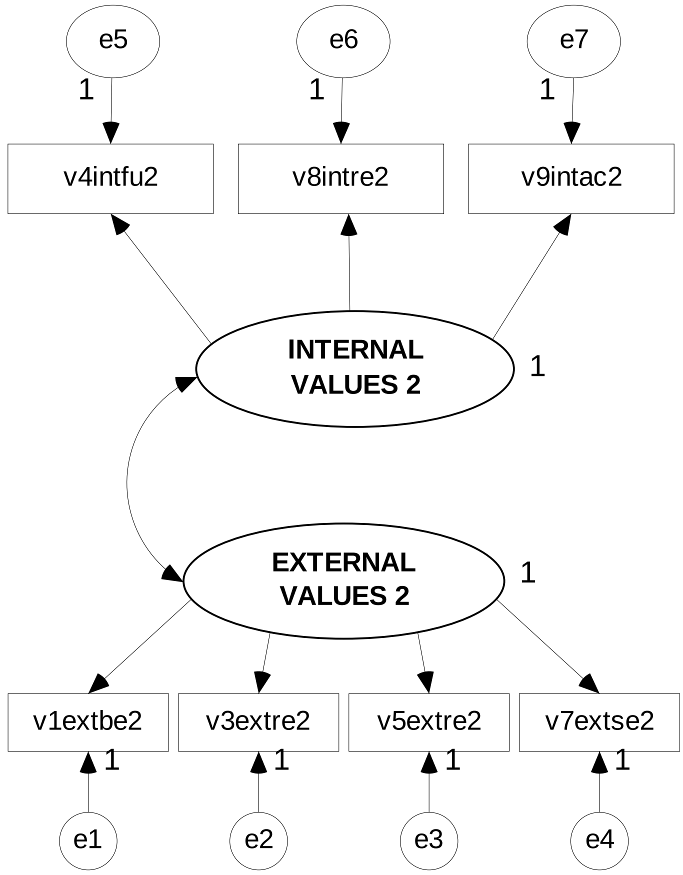


**Exhibit 0.22: Paired One Factor Congeneric Model for Internal Values & External Values at $T_2$**
***(Nascent Entrepreneurs)***

Exhibit 0.23 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Internal Values and External Values at $T_2$. The sample correlations between the observed items for the Internal Values and External Values constructs ranged from 0.186 to 0.248. The correlation between the Internal Values construct items ranged from 0.489 to 0.607 and the correlations between the External Values construct items ranged from 0.530 to 0.630.

The Internal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Internal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v9intac2 | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v4intfu2 | v8intre2 |
|---|---|---|---|---|---|---|---|
| v9intac2 | 3.102 | | | | | | |
| v7extse2 | .577 | 2.521 | | | | | |
| v1extbe2 | .574 | 1.509 | 2.275 | | | | |
| v3extre2 | .468 | 1.354 | 1.335 | 2.314 | | | |
| v5extre2 | .558 | 1.273 | 1.274 | 1.197 | 2.203 | | |
| v4intfu2 | 1.823 | .672 | .599 | .504 | .574 | 2.907 | |
| v8intre2 | 1.592 | .601 | .475 | .465 | .485 | 1.369 | 2.693 |

Condition number = 9.556
Eigenvalues 8.113 4.323 1.442 1.169 1.068 1.051 .849
Determinant of sample covariance matrix = 56.379

**Sample Correlations (Default)**

| | v9intac2 | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v4intfu2 | v8intre2 |
|---|---|---|---|---|---|---|---|
| v9intac2 | 1.000 | | | | | | |
| v7extse2 | .206 | 1.000 | | | | | |
| v1extbe2 | .216 | .630 | 1.000 | | | | |
| v3extre2 | .175 | .561 | .582 | 1.000 | | | |
| v5extre2 | .214 | .540 | .569 | .530 | 1.000 | | |
| v4intfu2 | .607 | .248 | .233 | .194 | .227 | 1.000 | |
| v8intre2 | .551 | .230 | .192 | .186 | .199 | .489 | 1.000 |

Condition number = 9.027
Eigenvalues 3.193 1.617 .523 .476 .448 .390 .354

**Exhibit 0.23: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Internal (and External) Values at $T_2$**
***(Nascent Entrepreneurs)***

Exhibit 0.24 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Internal Values and External Values at $T_2$. As can be seen from the Regression Weights, the Internal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore the Internal Values indicator items significantly contribute toward the variance of the Internal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights for Internal Values range from 0.672 to 0.812 (and External Values from 0.711 to 0.805). These represent the correlations between each item and the Internal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Internal Values items ranges from 0.452 to 0.659 (and for External Values 0.506 to 0.648).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | 1.055 | .082 | 12.864 | *** | par_1 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | 1.106 | .083 | 13.242 | *** | par_2 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | 1.214 | .080 | 15.177 | *** | par_3 |
| v8intre2 | <--- | INTERNAL_VALUES 2 | 1.103 | .096 | 11.442 | *** | par_5 |
| v4intfu2 | <--- | INTERNAL_VALUES 2 | 1.271 | .099 | 12.785 | *** | par_6 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | 1.230 | .085 | 14.418 | *** | par_7 |
| v9intac2 | <--- | INTERNAL_VALUES 2 | 1.430 | .102 | 14.009 | *** | par_8 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | .711 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | .727 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | .805 |
| v8intre2 | <--- | INTERNAL_VALUES 2 | .672 |
| v4intfu2 | <--- | INTERNAL_VALUES 2 | .745 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | .775 |
| v9intac2 | <--- | INTERNAL_VALUES 2 | .812 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v9intac2 | .659 |
| v7extse2 | .600 |
| v1extbe2 | .648 |
| v3extre2 | .528 |
| v5extre2 | .506 |
| v4intfu2 | .555 |
| v8intre2 | .452 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 2 | <--> | INTERNAL_VALUES 2 | .366 |

**Exhibit 0.24: Scalars for Internal Values at $T_2$**
**(*Nascent Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Internal Values and External Values at $T_2$ for the Nascent Entrepreneur Group is 0.366. To calculate the extent to which the Internal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.25. Inspection of the structure coefficients for both the Internal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| Indicator Variables | Internal Values2 | | External Values2 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre2 | 0* | 0.260 | 0.711 | **0.711** |
| v3extre2 | 0* | 0.266 | 0.727 | **0.727** |
| v1extbe2 | 0* | 0.295 | 0.805 | **0.805** |
| v8intre2 | 0.672 | **0.672** | 0* | 0.246 |
| v4intfu2 | 0.745 | **0.745** | 0* | 0.273 |
| v7extse2 | 0* | 0.284 | 0.775 | **0.775** |
| v9intac2 | 0.812 | **0.812** | 0* | 0.297 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.25: Factor Pattern and Structure Coefficients for Internal Values & External Values @ $T_2$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.26 presents the Nascent Entrepreneur Group Model Fit statistics for the Internal and External Values measurement model at $T_2$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Internal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Internal Values construct dimension at $T_2$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 4.304 with 13df and p = 0.988 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0172 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.020 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.26: Model Fit Statistics for Internal & External Values Measurement Model at $T_2$ (*Nascent Entrepreneurs*)**

## 2.6 Internal Values @ $T_3$ – *Nascent Entrepreneur Group*

Exhibit 0.27 provides an overview of the one factor congeneric model for the construct, Internal Values at $T_3$ for the Nascent Entrepreneur Group. There are three indicator items (variable names appear in brackets):

- Self-Fulfilment (to find peace of mind and to make the best use of my talents) (v4intfu3)
- Self-Respect (to be proud of myself and confident of who I am) (v8intre3)

- A Sense of Accomplishment (to succeed at what I want to do) (v9intac3)

The latent variable, Internal Values (measured at $T_3$), is a function of the observed variables: v4intfu3, v8intre3, and v9intac3.

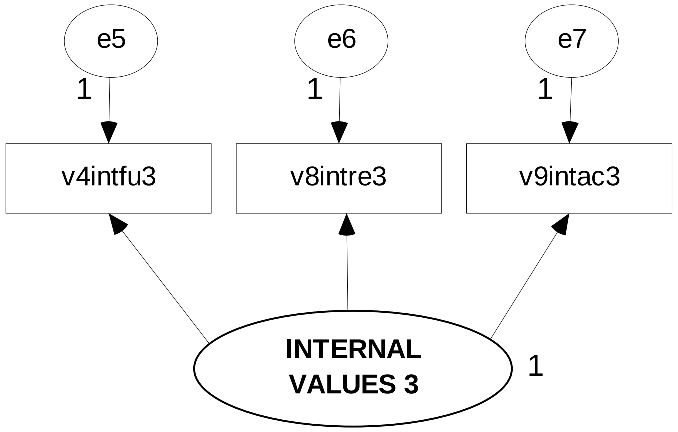


**Exhibit 0.27: One Factor Congeneric Model for Internal Values at $T_3$**
***(Nascent Entrepreneurs)***

Because the Internal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Internal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 0.28.

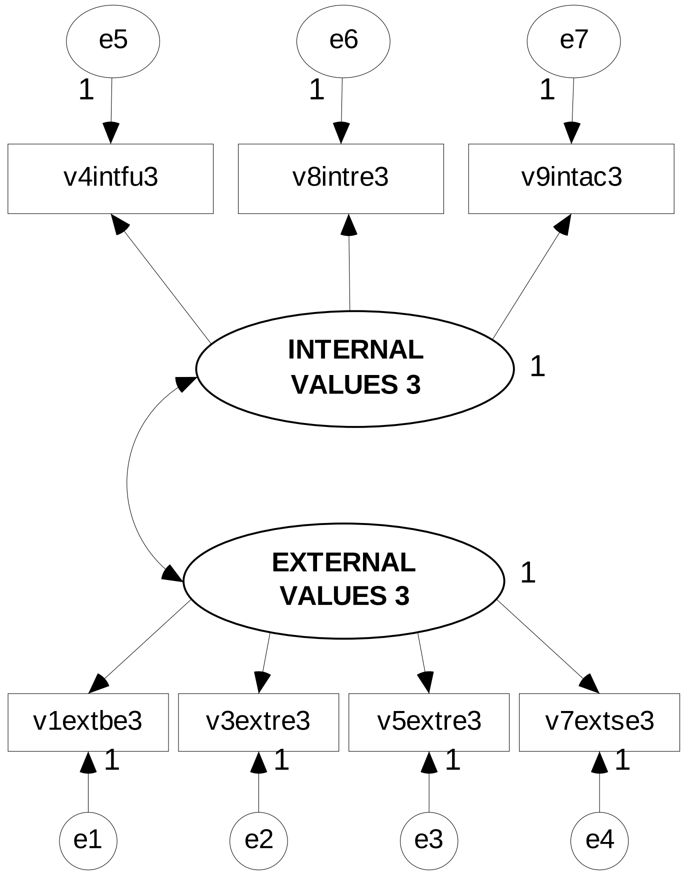


**Exhibit 0.28: Paired One Factor Congeneric Model for Internal Values & External Values at $T_3$**
***(Nascent Entrepreneurs)***

Exhibit 0.29 shows the Nascent Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Internal Values and External Values at $T_3$. The sample correlations between the observed items for the Internal Values and External Values constructs ranged from 0.176 to 0.292. The correlation between the Internal Values construct items ranged from 0.513 to 0.565 and the correlations between the External Values construct items ranged from 0.579 to 0.658.

The Internal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Internal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v9intac3 | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v4intfu3 | v8intre3 |
|---|---|---|---|---|---|---|---|
| v9intac3 | 3.215 | | | | | | |
| v7extse3 | .665 | 2.060 | | | | | |
| v1extbe3 | .503 | 1.348 | 2.034 | | | | |
| v3extre3 | .603 | 1.224 | 1.255 | 2.097 | | | |
| v5extre3 | .436 | 1.148 | 1.185 | 1.161 | 1.912 | | |
| v4intfu3 | 1.769 | .596 | .617 | .652 | .628 | 3.052 | |
| v8intre3 | 1.572 | .673 | .554 | .552 | .510 | 1.436 | 2.571 |

Condition number = 11.684
Eigenvalues 7.958 3.913 1.417 1.287 .870 .815 .681
Determinant of sample covariance matrix = 27.430

**Sample Correlations (Default)**

| | v9intac3 | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v4intfu3 | v8intre3 |
|---|---|---|---|---|---|---|---|
| v9intac3 | 1.000 | | | | | | |
| v7extse3 | .258 | 1.000 | | | | | |
| v1extbe3 | .197 | .658 | 1.000 | | | | |
| v3extre3 | .232 | .589 | .608 | 1.000 | | | |
| v5extre3 | .176 | .579 | .601 | .580 | 1.000 | | |
| v4intfu3 | .565 | .238 | .248 | .258 | .260 | 1.000 | |
| v8intre3 | .547 | .292 | .242 | .238 | .230 | .513 | 1.000 |

Condition number = 10.229
Eigenvalues 3.350 1.545 .511 .460 .412 .393 .328

**Exhibit 0.29: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Internal (and External) Values at $T_3$**
***(Nascent Entrepreneurs)***

Exhibit 0.30 provides the Nascent Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Internal Values and External Values at $T_3$. As can be seen from the Regression Weights, the Internal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore the Internal Values indicator items significantly contribute toward the variance of the Internal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Nascent Entrepreneur Group standardised regression weights for Internal Values range from 0.714 to 0.760 (and External Values from 0.742 to 0.813). These represent the correlations between each item and the Internal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Internal Values items ranges from 0.509 to 0.578 (and for External Values 0.551 to 0.632).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | 1.026 | .074 | 13.802 | *** | par_1 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | 1.093 | .077 | 14.119 | *** | par_2 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | 1.160 | .074 | 15.662 | *** | par_3 |
| v8intre3 | <--- | INTERNAL_VALUES 3 | 1.144 | .094 | 12.125 | *** | par_5 |
| v4intfu3 | <--- | INTERNAL_VALUES 3 | 1.284 | .103 | 12.514 | *** | par_6 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | 1.141 | .075 | 15.168 | *** | par_7 |
| v9intac3 | <--- | INTERNAL_VALUES 3 | 1.363 | .105 | 12.979 | *** | par_8 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | .742 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | .755 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | .813 |
| v8intre3 | <--- | INTERNAL_VALUES 3 | .714 |
| v4intfu3 | <--- | INTERNAL_VALUES 3 | .735 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | .795 |
| v9intac3 | <--- | INTERNAL_VALUES 3 | .760 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v9intac3 | .578 |
| v7extse3 | .632 |
| v1extbe3 | .661 |
| v3extre3 | .570 |
| v5extre3 | .551 |
| v4intfu3 | .540 |
| v8intre3 | .509 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 3 | <--> | INTERNAL_VALUES 3 | .414 |

**Exhibit 0.30: Scalars for Internal Values at $T_3$**
**(Nascent Entrepreneurs)**

**Discriminant Validity**: The construct correlation between Internal Values and External Values at $T_3$ for the Nascent Entrepreneur Group is 0.414. To calculate the extent to which the Internal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.31. Inspection of the structure coefficients for both the Internal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| | Internal Values3 | | External Values3 | |
|---|---|---|---|---|
| Indicator Variables | Pattern | Structure | Pattern | Structure |
| v5extre3 | 0* | 0.307 | 0.742 | **0.742** |
| v3extre3 | 0* | 0.313 | 0.755 | **0.755** |
| v1extbe3 | 0* | 0.337 | 0.813 | **0.813** |
| v8intre3 | 0.714 | **0.714** | 0* | 0.296 |
| v4intfu3 | 0.735 | **0.735** | 0* | 0.304 |
| v7extse3 | 0* | 0.329 | 0.795 | **0.795** |
| v9intac3 | 0.760 | **0.760** | 0* | 0.315 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.31: Factor Pattern and Structure Coefficients for Internal Values & External Values @ $T_3$ *(Nascent Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.32 presents the Nascent Entrepreneur Group Model Fit statistics for the Internal and External Values measurement model at $T_3$. These indicate to what extent the model “fits” the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Internal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Internal Values construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 10.582 with 13df and p = 0.646 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0220 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.955<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.005 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.32: Model Fit Statistics for Internal & External Values Measurement Model at $T_3$ (*Nascent Entrepreneurs*)**

## 3.0 *Non-Entrepreneur Group* One Factor Congeneric Models

This section presents the results of the analyses for the *Non-Entrepreneur Group* one factor congeneric models for Values at $T_2$ and $T_3$.

### 3.1 External Values @ $T_2$ - *Non-Entrepreneur Group*

Exhibit 0.33 provides an overview of the one factor congeneric model for the construct, External Values at $T_2$ for the Non-Entrepreneur Group. There are four indicator items (variable names appear in brackets):

- Sense of Belonging (to be accepted and needed by friends, family, and community) (v1extbe2)
- Warm Relationships with Others (to have close companionship and intimate friendship) (v3extre2)
- Being Well-Respected (to be admired by others and to receive recognition) (v5extre2)
- Security (to be safe and protected from misfortune and attack) (v7extse2).

The latent variable, External Values (measured at $T_2$), is a function of the observed variables: v1extbe2, v3extre2, v5extre2, and v7extse2.

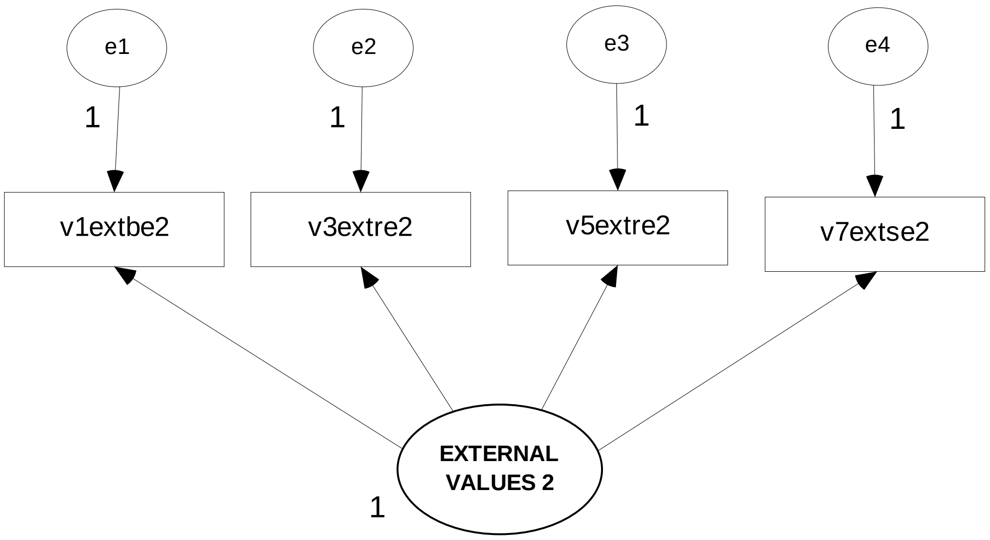


**Exhibit 0.33: One Factor Congeneric Model for External Values at $T_2$**
***(Non-Entrepreneurs)***

Exhibit 0.34 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for External Values at $T_2$. The sample correlations ranged from a low of 0.479 to a high of 0.611. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | v1extbe2 | v3extre2 | v7extse2 | v5extre2 |
|---|---|---|---|---|
| v1extbe2 | 2.649 | | | |
| v3extre2 | 1.787 | 3.645 | | |
| v7extse2 | 1.256 | 1.867 | 2.584 | |
| v5extre2 | 1.425 | 2.131 | 1.610 | 3.339 |

Condition number = 7.138
Eigenvalues 8.221 1.543 1.302 1.152
Determinant of sample covariance matrix = 19.014

**Sample Correlations (Default)**

| | v1extbe2 | v3extre2 | v7extse2 | v5extre2 |
|---|---|---|---|---|
| v1extbe2 | 1.000 | | | |
| v3extre2 | .575 | 1.000 | | |
| v7extse2 | .480 | .609 | 1.000 | |
| v5extre2 | .479 | .611 | .548 | 1.000 |

Condition number = 7.569
Eigenvalues 2.655 .542 .452 .351

**Exhibit 0.34: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for External Values at $T_2$** ***(Non-Entrepreneurs)***

Exhibit 0.35 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for External Values at $T_2$. As can be seen from the Regression Weights, three of the four observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the External Values factor; thus, all items are retained. The fourth factor weight (for v1extbe2) was not estimated by AMOS as when External Values increases by one, v1extbe2 goes up by one. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.671 to 0.841. These represent the correlations between each item and the External Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.450 to 0.708.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v7extse2 | <--- | EXTERNAL_VALUES 2 | 1.073 | .172 | 6.249 | *** | par_1 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | 1.470 | .217 | 6.773 | *** | par_2 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | 1.000 | | | | |
| v5extre2 | <--- | EXTERNAL_VALUES 2 | 1.222 | .195 | 6.260 | *** | par_3 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v7extse2 | <--- | EXTERNAL_VALUES 2 | .729 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | .841 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | .671 |
| v5extre2 | <--- | EXTERNAL_VALUES 2 | .731 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v1extbe2 | .450 |
| v3extre2 | .708 |
| v7extse2 | .531 |
| v5extre2 | .534 |

**Exhibit 0.35: Scalars for External Values at $T_2$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 0.36 presents the Non-Entrepreneur Group Model Fit statistics for External Values at $T_2$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the External Values construct dimension at $T_2$.

| **Model Fit Index** | **Model Fit Results** | **Acceptable Levels** |
|---|---|---|
| Chi-square | $\chi^2$ = 0.297 with 2df and p = 0.862 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0077 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0. 892<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.034 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.00 | CFI > 0.95 |

**Exhibit 0.36: Model Fit Statistics for External Values at $T_2$**
**(*Non-Entrepreneurs*)**

### 3.2 External Values @ $T_3$ - *Non-Entrepreneur Group*

Exhibit 0.37 provides an overview of the one factor congeneric model for the construct, External Values at $T_2$ for the Non-Entrepreneur Group. There are four indicator items (variable names appear in brackets):

- Sense of Belonging (to be accepted and needed by friends, family, and community) (v1extbe3)
- Warm Relationships with Others (to have close companionship and intimate friendship) (v3extre3)

- Being Well-Respected (to be admired by others and to receive recognition) (v5extre3)
- Security (to be safe and protected from misfortune and attack) (v7extse3).

The latent variable, External Values (measured at $T_3$), is a function of the observed variables: v1extbe3, v3extre3, v5extre3, and v7extse3.

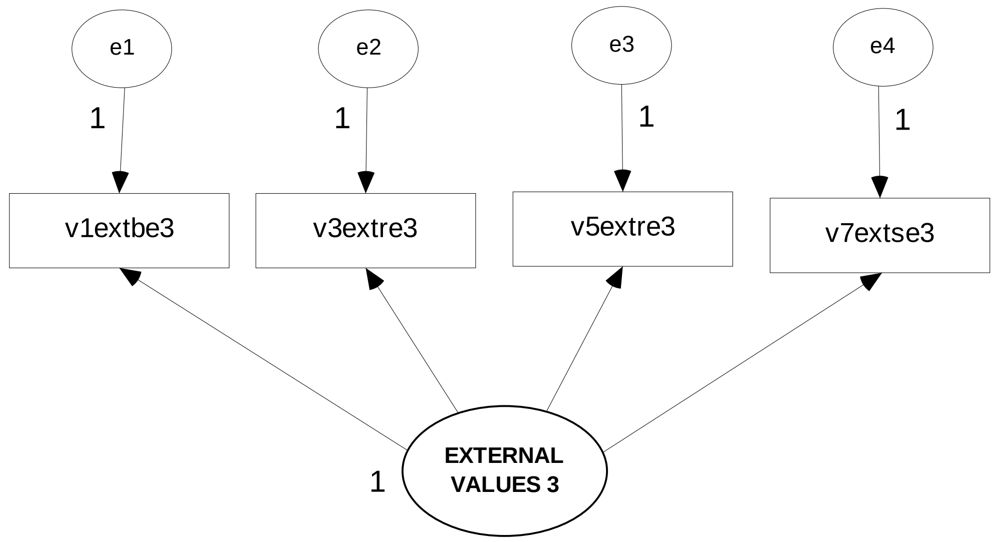


**Exhibit 0.37: One Factor Congeneric Model for External Values at $T_3$**
***(Non-Entrepreneurs)***

Exhibit 0.38 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric model for External Values at $T_3$. The sample correlations ranged from a low of 0.492 to a high of 0.631. These values suggest that item redundancy is not a problem. The eigenvalues suggest that a one-factor solution is a reasonable solution.

**Sample Covariances (Default)**

| | v1extbe3 | v3extre3 | v7extse3 | v5extre3 |
|---|---|---|---|---|
| v1extbe3 | 3.199 | | | |
| v3extre3 | 2.075 | 3.383 | | |
| v7extse3 | 1.509 | 1.945 | 2.938 | |
| v5extre3 | 1.726 | 2.100 | 1.625 | 3.648 |

Condition number = 8.371
Eigenvalues 8.825 1.737 1.552 1.054
Determinant of sample covariance matrix = 25.088

**Sample Correlations (Default)**

| | v1extbe3 | v3extre3 | v7extse3 | v5extre3 |
|---|---|---|---|---|
| v1extbe3 | 1.000 | | | |
| v3extre3 | .631 | 1.000 | | |
| v7extse3 | .492 | .617 | 1.000 | |
| v5extre3 | .505 | .598 | .496 | 1.000 |

Condition number = 8.375
Eigenvalues 2.674 .510 .497 .319

**Exhibit 0.38: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for External Values at $T_3$**
***(Non-Entrepreneurs)***

Exhibit 0.39 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations) for External Values at $T_3$. As can be seen from the Regression Weights, all of the four observed variables (factor coefficients) are statistically significant and therefore all significantly contribute toward the variance of the External Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights range from 0.692 to 0.872. These represent the correlations between each item and the External Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the items ranges from 0.479 to 0.761.

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v7extse3 | <--- | EXTERNAL_VALUES 3 | 1.207 | .156 | 7.718 | *** | par_1 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | 1.605 | .157 | 10.225 | *** | par_2 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | 1.287 | .162 | 7.932 | *** | par_3 |
| v5extre3 | <--- | EXTERNAL_VALUES 3 | 1.322 | .175 | 7.552 | *** | par_4 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v7extse3 | <--- | EXTERNAL_VALUES 3 | .704 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | .872 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | .719 |
| v5extre3 | <--- | EXTERNAL_VALUES 3 | .692 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v1extbe3 | .518 |
| v3extre3 | .761 |
| v7extse3 | .496 |
| v5extre3 | .479 |

**Exhibit 0.39: Scalars for External Values at $T_3$**
**(*Non-Entrepreneurs*)**

**Model Fit**: Exhibit 0.40 presents the Non-Entrepreneur Group Model Fit statistics for External Values at $T_3$. Since all results are within the acceptable levels, there is good model fit. This also confirms construct validity of the External Values construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 0.189 with 2df and p = 0.910 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0. 930<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.035 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.40: Model Fit Statistics for External Values at $T_3$**
**(*Non-Entrepreneurs*)**

### 3.3 Interpersonal Values @ $T_2$ – *Non-Entrepreneur Group*

Exhibit 0.41 provides an overview of the one factor congeneric model for the construct, Interpersonal Values at $T_2$ for the Non-Entrepreneur Group. There are two indicator items (variable names appear in brackets):

- Excitement (to experience stimulation and thrills) (v2funex2)
- Fun and Enjoyment in Life (to lead a pleasurable happy life) (v6funfu2)

The latent variable, Interpersonal Values (measured at $T_2$), is a function of the observed variables: v2funex2 and v6funfu2.

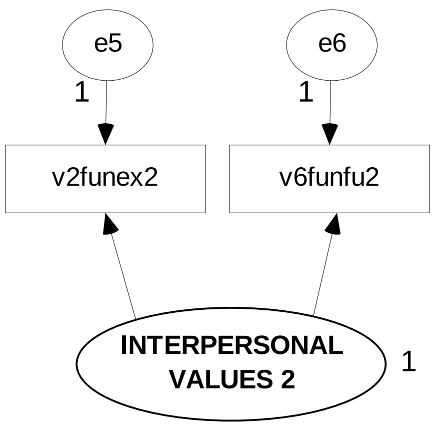


**Exhibit 0.41: One Factor Congeneric Model for Interpersonal Values at $T_2$**
***(Non-Entrepreneurs)***

Because the Interpersonal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be “paired” with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Interpersonal Values construct is paired with the External Values construct. The “paired” arrangement appears in Exhibit 0.42.

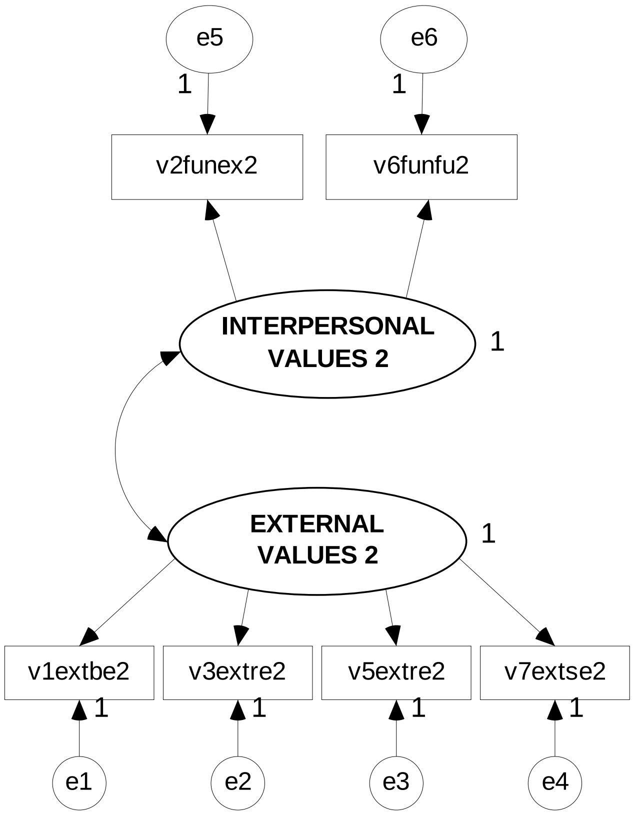


**Exhibit 0.42: Paired One Factor Congeneric Model for Interpersonal Values & External Values at $T_2$**
***(Non-Entrepreneurs)***

Exhibit 0.43 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Interpersonal Values and External Values at $T_2$. The sample correlations between the observed items for the Interpersonal Values and External Values constructs range from 0.229 to 0.356. The correlation between the Interpersonal Values construct items was 0.633 and the correlations between the External Values construct items ranged from 0.479 to 0.611.

The Interpersonal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Interpersonal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v2funex2 | v6funfu2 |
|---|---|---|---|---|---|---|
| v7extse2 | 2.584 | | | | | |
| v1extbe2 | 1.256 | 2.649 | | | | |
| v3extre2 | 1.867 | 1.787 | 3.645 | | | |
| v5extre2 | 1.610 | 1.425 | 2.131 | 3.339 | | |
| v2funex2 | .829 | .714 | 1.073 | .918 | 2.491 | |
| v6funfu2 | .657 | .607 | 1.029 | .725 | 1.629 | 2.654 |

Condition number = 10.294
Eigenvalues 9.304 3.140 1.545 1.296 1.173 .904
Determinant of sample covariance matrix = 62.055

**Sample Correlations (Default)**

| | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v2funex2 | v6funfu2 |
|---|---|---|---|---|---|---|
| v7extse2 | 1.000 | | | | | |
| v1extbe2 | .480 | 1.000 | | | | |
| v3extre2 | .609 | .575 | 1.000 | | | |
| v5extre2 | .548 | .479 | .611 | 1.000 | | |
| v2funex2 | .327 | .278 | .356 | .318 | 1.000 | |
| v6funfu2 | .251 | .229 | .331 | .243 | .633 | 1.000 |

Condition number = 9.533
Eigenvalues 3.119 1.177 .543 .452 .382 .327

**Exhibit 0.43: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Interpersonal (and External) Values at $T_2$** ***(Non-Entrepreneurs)***

Exhibit 0.44 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Interpersonal Values and External Values at $T_2$. As can be seen from the Regression Weights, the two Interpersonal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore both Interpersonal Values indicator items significantly contribute toward the variance of the Interpersonal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights for Interpersonal Values range from 0. 732 to 0.866 (and External Values from 0.669 to 0.843). These represent the correlations between each item and the Interpersonal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Interpersonal Values items ranges from 0.535 to 0.749 (and for External Values 0.448 to 0.710).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | 1.333 | .165 | 8.073 | *** | par_1 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | 1.609 | .164 | 9.790 | *** | par_2 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | 1.089 | .151 | 7.214 | *** | par_3 |
| v6funfu2 | <--- | INTERPERSONAL_VALUES 2 | 1.192 | .187 | 6.378 | *** | par_5 |
| v2funex2 | <--- | INTERPERSONAL_VALUES 2 | 1.366 | .191 | 7.160 | *** | par_6 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | 1.173 | .145 | 8.071 | *** | par_7 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | .730 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | .843 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | .669 |
| v6funfu2 | <--- | INTERPERSONAL_VALUES 2 | .732 |
| v2funex2 | <--- | INTERPERSONAL_VALUES 2 | .866 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | .730 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v7extse2 | .532 |
| v1extbe2 | .448 |
| v3extre2 | .710 |
| v5extre2 | .532 |
| v2funex2 | .749 |
| v6funfu2 | .535 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 2 | <--> | INTERPERSONAL_VALUES 2 | .496 |

**Exhibit 0.44: Scalars for Interpersonal Values at $T_2$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Interpersonal Values and External Values at $T_2$ for the Non-Entrepreneur Group is 0.496. To calculate the extent to which the Interpersonal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.45. Inspection of the structure coefficients for both the Interpersonal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| | Interpersonal Values2 | | External Values2 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre2 | 0* | 0.362 | 0.73 | **0.730** |
| v3extre2 | 0* | 0.418 | 0.843 | **0.843** |
| v1extbe2 | 0* | 0.332 | 0.669 | **0.669** |
| v6funfu2 | 0.732 | **0.732** | 0* | 0.363 |
| v2funex2 | 0.866 | **0.866** | 0* | 0.430 |
| v7extse2 | 0* | 0.362 | 0.73 | **0.730** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.45: Factor Pattern and Structure Coefficients for Interpersonal Values & External Values @ $T_2$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.46 presents the Non-Entrepreneur Group Model Fit statistics for the Interpersonal and External Values measurement model at $T_2$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Interpersonal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Interpersonal Values construct dimension at $T_2$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 1.295 with 8df and p = 0.996 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0106 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.998<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.059 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.46: Model Fit Statistics for Interpersonal & External Values Measurement Model at $T_2$ (*Non-Entrepreneurs*)**

## 3.4 Interpersonal Values @ $T_3$ – *Non-Entrepreneur Group*

Exhibit 0.47 provides an overview of the one factor congeneric model for the construct, Interpersonal Values at $T_3$ for the Non-Entrepreneur Group. There are two indicator items (variable names appear in brackets):

- Excitement (to experience stimulation and thrills) (v2funex3)

- Fun and Enjoyment in Life (to lead a pleasurable happy life) (v6funfu3)

The latent variable, Interpersonal Values (measured at $T_3$), is a function of the observed variables: v2funex3 and v6funfu3.

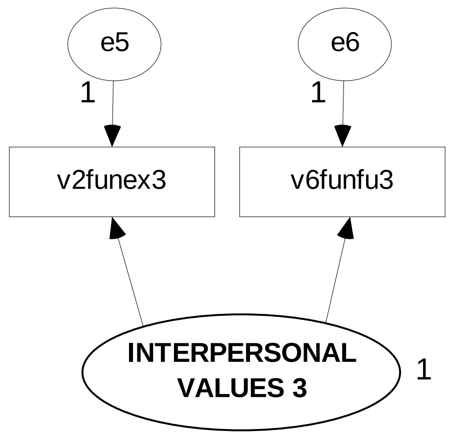


**Exhibit 0.47: One Factor Congeneric Model for Interpersonal Values at $T_3$**
***(Non-Entrepreneurs)***

Because the Interpersonal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Interpersonal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 0.48.

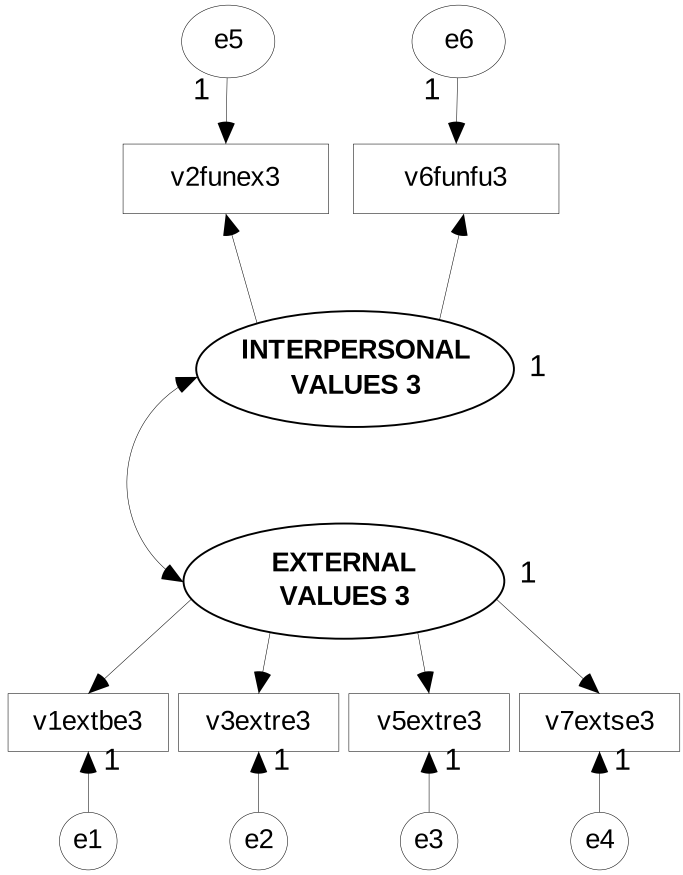


**Exhibit 0.48: Paired One Factor Congeneric Model for Interpersonal Values & External Values at $T_3$** ***(Non-Entrepreneurs)***

Exhibit 0.49 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Interpersonal Values and External Values at $T_3$. The sample correlations between the observed items for the Interpersonal Values and External Values constructs range from 0.199 to 0.318. The correlation between the Interpersonal Values construct items was 0.625 and the correlations between the External Values construct items ranged from 0.492 to 0.631.

The Interpersonal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Interpersonal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v2funex3 | v6funfu3 |
|---|---|---|---|---|---|---|
| v7extse3 | 2.938 | | | | | |
| v1extbe3 | 1.509 | 3.199 | | | | |
| v3extre3 | 1.945 | 2.075 | 3.383 | | | |
| v5extre3 | 1.625 | 1.726 | 2.100 | 3.648 | | |
| v2funex3 | .652 | .560 | .891 | .758 | 2.476 | |
| v6funfu3 | .659 | .712 | .950 | .771 | 1.596 | 2.631 |

Condition number = 10.225
Eigenvalues 9.645 3.346 1.741 1.557 1.044 .943
Determinant of sample covariance matrix = 86.100

**Sample Correlations (Default)**

| | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v2funex3 | v6funfu3 |
|---|---|---|---|---|---|---|
| v7extse3 | 1.000 | | | | | |
| v1extbe3 | .492 | 1.000 | | | | |
| v3extre3 | .617 | .631 | 1.000 | | | |
| v5extre3 | .496 | .505 | .598 | 1.000 | | |
| v2funex3 | .242 | .199 | .308 | .252 | 1.000 | |
| v6funfu3 | .237 | .245 | .318 | .249 | .625 | 1.000 |

Condition number = 9.671
Eigenvalues 3.047 1.256 .513 .499 .369 .315

**Exhibit 0.49: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Interpersonal (and External) Values at $T_3$** ***(Non-Entrepreneurs)***

Exhibit 0.50 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Interpersonal Values and External Values at $T_3$. As can be seen from the Regression Weights, the two Interpersonal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore both Interpersonal Values indicator items significantly contribute toward the variance of the Interpersonal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights for Interpersonal Values range from 0.773 to 0.809 (and External Values from 0.692 to 0.876). These represent the correlations between each item and the Interpersonal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Interpersonal Values items ranges from 0.598 to 0.654 (and for External Values 0.479 to 0.768).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | 1.322 | .174 | 7.582 | *** | par_1 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | 1.612 | .155 | 10.385 | *** | par_2 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | 1.280 | .162 | 7.912 | *** | par_3 |
| v6funfu3 | <--- | INTERPERSONAL_VALUES 3 | 1.312 | .207 | 6.327 | *** | par_5 |
| v2funex3 | <--- | INTERPERSONAL_VALUES 3 | 1.216 | .197 | 6.160 | *** | par_6 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | 1.204 | .156 | 7.730 | *** | par_7 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | .692 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | .876 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | .715 |
| v6funfu3 | <--- | INTERPERSONAL_VALUES 3 | .809 |
| v2funex3 | <--- | INTERPERSONAL_VALUES 3 | .773 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | .703 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v7extse3 | .494 |
| v1extbe3 | .512 |
| v3extre3 | .768 |
| v5extre3 | .479 |
| v2funex3 | .598 |
| v6funfu3 | .654 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 3 | <--> | INTERPERSONAL_VALUES 3 | .439 |

**Exhibit 0.50: Scalars for Interpersonal Values at $T_3$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Interpersonal Values and External Values at $T_3$ for the Non-Entrepreneur Group is 0.439. To calculate the extent to which the Interpersonal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.51. Inspection of the structure coefficients for both the Interpersonal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| | Interpersonal Values3 | | External Values3 | |
|---|---|---|---|---|
| **Indicator Variables** | **Pattern** | **Structure** | **Pattern** | **Structure** |
| v5extre3 | 0* | 0.304 | 0.692 | **0.692** |
| v3extre3 | 0* | 0.385 | 0.876 | **0.876** |
| v1extbe3 | 0* | 0.314 | 0.715 | **0.715** |
| v6funfu3 | 0.809 | **0.809** | 0* | 0.355 |
| v2funex3 | 0.773 | **0.773** | 0* | 0.339 |
| v7extse3 | 0* | 0.309 | 0.703 | **0.703** |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.51: Factor Pattern and Structure Coefficients for Interpersonal Values & External Values @ $T_3$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.52 presents the Non-Entrepreneur Group Model Fit statistics for the Interpersonal and External Values measurement model at $T_3$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Interpersonal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Interpersonal Values construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2 = 1.003$ with 8df and $p = 0.998$ | $p > 0.05$ |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0120 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.999<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.062 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.52: Model Fit Statistics for Interpersonal & External Values Measurement Model at $T_3$ (*Non-Entrepreneurs*)**

## 3.5 Internal Values @ $T_2$ – *Non-Entrepreneur Group*

Exhibit 0.53 provides an overview of the one factor congeneric model for the construct, Internal Values at $T_2$ for the Non-Entrepreneur Group. There are three indicator items (variable names appear in brackets):

- Self-Fulfilment (to find peace of mind and to make the best use of my talents) (v4intfu2)
- Self-Respect (to be proud of myself and confident of who I am) (v8intre2)

- A Sense of Accomplishment (to succeed at what I want to do) (v9intac2)

The latent variable, Internal Values (measured at $T_2$), is a function of the observed variables: v4intfu2, v8intre2, and v9intac2.

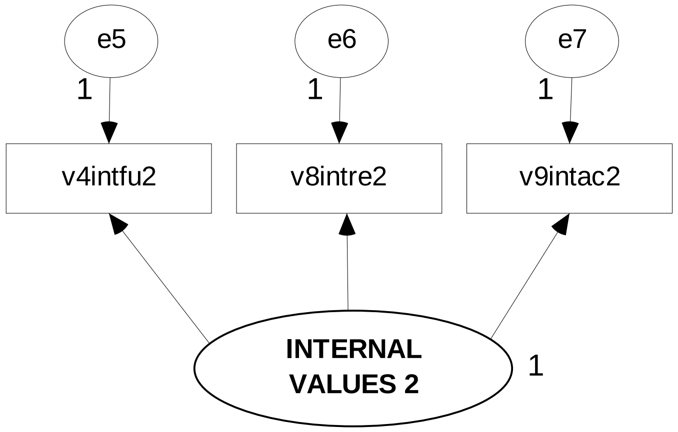


**Exhibit 0.53: One Factor Congeneric Model for Internal Values at $T_2$**
***(Non-Entrepreneurs)***

Because the Internal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Internal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 0.54.

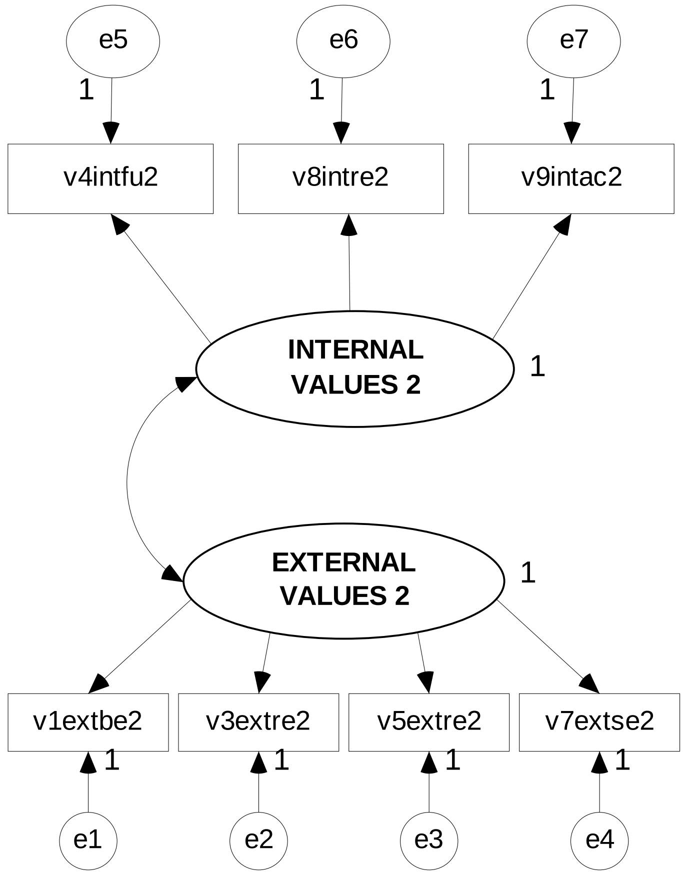


**Exhibit 0.54: Paired One Factor Congeneric Model for Internal Values and External Values at $T_2$ *(Non-Entrepreneurs)***

Exhibit 0.55 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Internal Values and External Values at $T_2$. The sample correlations between the observed items for the Internal Values and External Values constructs ranged from 0.096 to 0.201. The correlation between the Internal Values construct items ranged from 0.549 to 0.636 and the correlations between the External Values construct items ranged from 0.479 to 0.611.

The Internal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Internal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v9intac2 | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v4intfu2 | v8intre2 |
|---|---|---|---|---|---|---|---|
| v9intac2 | 2.947 | | | | | | |
| v7extse2 | .265 | 2.584 | | | | | |
| v1extbe2 | .373 | 1.256 | 2.649 | | | | |
| v3extre2 | .317 | 1.867 | 1.787 | 3.645 | | | |
| v5extre2 | .341 | 1.610 | 1.425 | 2.131 | 3.339 | | |
| v4intfu2 | 1.741 | .331 | .295 | .617 | .332 | 3.418 | |
| v8intre2 | 1.808 | .338 | .443 | .635 | .500 | 1.910 | 2.744 |

Condition number = 9.632
Eigenvalues 9.057 5.867 1.556 1.540 1.256 1.110 .940
Determinant of sample covariance matrix = 166.964

**Sample Correlations (Default)**

| | v9intac2 | v7extse2 | v1extbe2 | v3extre2 | v5extre2 | v4intfu2 | v8intre2 |
|---|---|---|---|---|---|---|---|
| v9intac2 | 1.000 | | | | | | |
| v7extse2 | .096 | 1.000 | | | | | |
| v1extbe2 | .133 | .480 | 1.000 | | | | |
| v3extre2 | .097 | .609 | .575 | 1.000 | | | |
| v5extre2 | .109 | .548 | .479 | .611 | 1.000 | | |
| v4intfu2 | .549 | .111 | .098 | .175 | .098 | 1.000 | |
| v8intre2 | .636 | .127 | .164 | .201 | .165 | .624 | 1.000 |

Condition number = 9.234
Eigenvalues 2.942 1.923 .549 .474 .450 .344 .319

**Exhibit 0.55: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Internal (and External) Values at $T_2$ *(Non-Entrepreneurs)***

Exhibit 0.56 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Internal Values and External Values at $T_2$. As can be seen from the Regression Weights, the Internal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore the Internal Values indicator items significantly contribute toward the variance of the Internal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights for Internal Values range from 0.732 to 0.856 (and External Values from 0.672 to 0.843). These represent the correlations between each item and the Internal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Internal Values items ranges from 0.535 to 0.733 (and for External Values 0.451 to 0.710).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | 1.334 | .166 | 8.036 | *** | par_1 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | 1.609 | .166 | 9.707 | *** | par_2 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | 1.093 | .151 | 7.222 | *** | par_3 |
| v8intre2 | <--- | INTERNAL_VALUES 2 | 1.418 | .150 | 9.441 | *** | par_5 |
| v4intfu2 | <--- | INTERNAL_VALUES 2 | 1.352 | .172 | 7.886 | *** | par_6 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | 1.168 | .146 | 7.993 | *** | par_7 |
| v9intac2 | <--- | INTERNAL_VALUES 2 | 1.275 | .159 | 8.021 | *** | par_8 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre2 | <--- | EXTERNAL_VALUES 2 | .730 |
| v3extre2 | <--- | EXTERNAL_VALUES 2 | .843 |
| v1extbe2 | <--- | EXTERNAL_VALUES 2 | .672 |
| v8intre2 | <--- | INTERNAL_VALUES 2 | .856 |
| v4intfu2 | <--- | INTERNAL_VALUES 2 | .732 |
| v7extse2 | <--- | EXTERNAL_VALUES 2 | .727 |
| v9intac2 | <--- | INTERNAL_VALUES 2 | .743 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v9intac2 | .552 |
| v7extse2 | .528 |
| v1extbe2 | .451 |
| v3extre2 | .710 |
| v5extre2 | .533 |
| v4intfu2 | .535 |
| v8intre2 | .733 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 2 | <--> | INTERNAL_VALUES 2 | .237 |

**Exhibit 0.56: Scalars for Internal Values at $T_2$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Internal Values and External Values at $T_2$ for the Non-Entrepreneur Group is 0.237. To calculate the extent to which the Internal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.57. Inspection of the structure coefficients for both the Internal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| Indicator Variables | Internal Values2 Pattern | Internal Values2 Structure | External Values2 Pattern | External Values2 Structure |
|---|---|---|---|---|
| v5extre2 | 0* | 0.173 | 0.730 | **0.730** |
| v3extre2 | 0* | 0.200 | 0.843 | **0.843** |
| v1extbe2 | 0* | 0.159 | 0.672 | **0.672** |
| v8intre2 | 0.856 | **0.856** | 0* | 0.203 |
| v4intfu2 | 0.732 | **0.732** | 0* | 0.173 |
| v7extse2 | 0* | 0.172 | 0.727 | **0.727** |
| v9intac2 | 0.743 | **0.743** | 0* | 0.176 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.57: Factor Pattern and Structure Coefficients for Internal Values & External Values @ $T_2$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.58 presents the Non-Entrepreneur Group Model Fit statistics for the Internal and External Values measurement model at $T_2$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Internal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Internal Values construct dimension at $T_2$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 3.462 with 13df and p = 0.996 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0185 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 0.999<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.061 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.58: Model Fit Statistics for Internal & External Values Measurement Model at $T_2$ (*Non-Entrepreneurs*)**

## 3.6 Internal Values @ $T_3$ – *Non-Entrepreneur Group*

Exhibit 0.59 provides an overview of the one factor congeneric model for the construct, Internal Values at $T_3$ for the Non-Entrepreneur Group. There are three indicator items (variable names appear in brackets):

- Self-Fulfilment (to find peace of mind and to make the best use of my talents) (v4intfu3)
- Self-Respect (to be proud of myself and confident of who I am) (v8intre3)

- A Sense of Accomplishment (to succeed at what I want to do) (v9intac3)

The latent variable, Internal Values (measured at $T_3$), is a function of the observed variables: v4intfu3, v8intre3, and v9intac3.

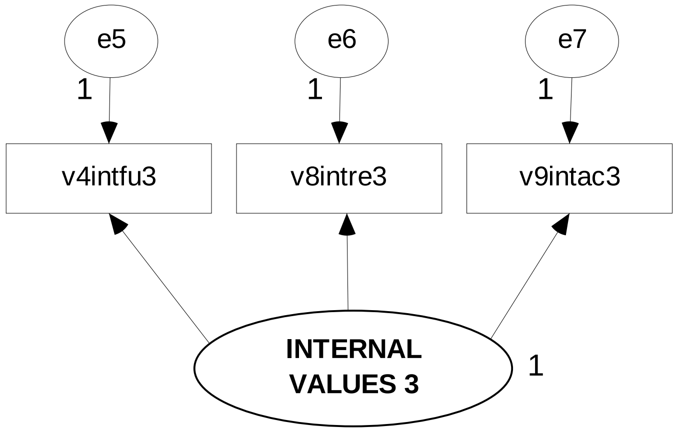


**Exhibit 0.59: One Factor Congeneric Model for Internal Values at $T_3$**
***(Non-Entrepreneurs)***

Because the Internal Values construct has less than four observed items, a one-factor congeneric model analysis cannot be undertaken on the construct individually because it has insufficient degrees of freedom (at least four observed items are needed). To undertake such an analysis, the construct needs to be "paired" with another construct so that there are sufficient degrees of freedom to allow the analysis to proceed (Cunningham, 2008). Since the External Values construct has already been analysed and the analyses indicate that the External Values one-factor congeneric models have been correctly specified, the Internal Values construct is paired with the External Values construct. The "paired" arrangement appears in Exhibit 0.60.

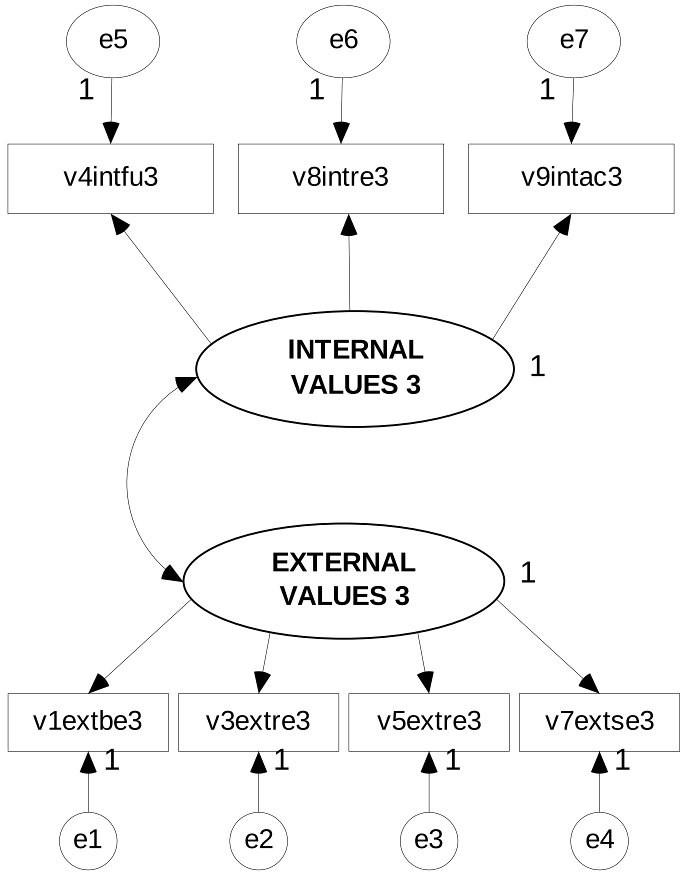


**Exhibit 0.60: Paired One Factor Congeneric Model for Internal Values & External Values at $T_3$**
***(Non-Entrepreneurs)***

Exhibit 0.61 shows the Non-Entrepreneur Group sample covariances, sample correlations, and eigenvalues for the one-factor congeneric models for Internal Values and External Values at $T_3$. The sample correlations between the observed items for the Internal Values and External Values constructs ranged from 0.138 to 0.230. The correlation between the Internal Values construct items ranged from 0.551 to 0.620 and the correlations between the External Values construct items ranged from 0.492 to 0.631.

The Internal Values value suggests that item redundancy is not a problem. The eigenvalues for the model suggest that a two-factor solution is a reasonable solution: Since we already know from the prior one-factor congeneric model analyses of External Values that External Values is comprised of only one factor, then we can conclude that Internal Values is comprised of one factor.

**Sample Covariances (Default)**

| | v9intac3 | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v4intfu3 | v8intre3 |
|---|---|---|---|---|---|---|---|
| v9intac3 | 3.274 | | | | | | |
| v7extse3 | .515 | 2.938 | | | | | |
| v1extbe3 | .445 | 1.509 | 3.199 | | | | |
| v3extre3 | .516 | 1.945 | 2.075 | 3.383 | | | |
| v5extre3 | .591 | 1.625 | 1.726 | 2.100 | 3.648 | | |
| v4intfu3 | 1.932 | .482 | .562 | .644 | .549 | 2.965 | |
| v8intre3 | 1.854 | .460 | .707 | .787 | .664 | 1.815 | 3.452 |

Condition number = 9.877
Eigenvalues 10.114 5.687 1.766 1.677 1.419 1.174 1.024
Determinant of sample covariance matrix = 290.472

**Sample Correlations (Default)**

| | v9intac3 | v7extse3 | v1extbe3 | v3extre3 | v5extre3 | v4intfu3 | v8intre3 |
|---|---|---|---|---|---|---|---|
| v9intac3 | 1.000 | | | | | | |
| v7extse3 | .166 | 1.000 | | | | | |
| v1extbe3 | .138 | .492 | 1.000 | | | | |
| v3extre3 | .155 | .617 | .631 | 1.000 | | | |
| v5extre3 | .171 | .496 | .505 | .598 | 1.000 | | |
| v4intfu3 | .620 | .163 | .183 | .203 | .167 | 1.000 | |
| v8intre3 | .551 | .145 | .213 | .230 | .187 | .567 | 1.000 |

Condition number = 9.904
Eigenvalues 3.082 1.754 .538 .501 .437 .377 .311

**Exhibit 0.61: Sample Covariances, Sample Correlations, & Eigenvalues for the One-Factor Congeneric Model for Internal (and External) Values at $T_3$**
***(Non-Entrepreneurs)***

Exhibit 0.62 provides the Non-Entrepreneur Group Scalars (Regression Weights, Standardised Regression Weights, and Squared Multiple Correlations of the indicator items as well as the Correlation between the constructs) for Internal Values and External Values at $T_3$. As can be seen from the Regression Weights, the Internal Values observed variables (factor coefficients) are statistically significant (as are the External Values observed variables) and therefore the Internal Values indicator items significantly contribute toward the variance of the Internal Values factor; thus, all items are retained. These results also indicate that there is support for *convergent validity*.

The Non-Entrepreneur Group standardised regression weights for Internal Values range from 0.717 to 0.799 (and External Values from 0.694 to 0.870). These represent the correlations between each item and the Internal Values factor. By squaring the standardised factor loadings (standardised regression coefficients), we can compute the proportion of variance in each variable explained by a factor (that is, the Squared Multiple Correlations or $R^2$). The $R^2$ for each of the Internal Values items ranges from 0.513 to 0.638 (and for External Values 0.482 to 0.757).

**Regression Weights: (Default - Default model)**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | 1.326 | .175 | 7.587 | *** | par_1 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | 1.601 | .156 | 10.234 | *** | par_2 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | 1.289 | .162 | 7.964 | *** | par_3 |
| v8intre3 | <--- | INTERNAL_VALUES 3 | 1.331 | .176 | 7.584 | *** | par_5 |
| v4intfu3 | <--- | INTERNAL_VALUES 3 | 1.376 | .161 | 8.554 | *** | par_6 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | 1.207 | .156 | 7.732 | *** | par_7 |
| v9intac3 | <--- | INTERNAL_VALUES 3 | 1.394 | .170 | 8.217 | *** | par_8 |

**Standardized Regression Weights: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| v5extre3 | <--- | EXTERNAL_VALUES 3 | .694 |
| v3extre3 | <--- | EXTERNAL_VALUES 3 | .870 |
| v1extbe3 | <--- | EXTERNAL_VALUES 3 | .721 |
| v8intre3 | <--- | INTERNAL_VALUES 3 | .717 |
| v4intfu3 | <--- | INTERNAL_VALUES 3 | .799 |
| v7extse3 | <--- | EXTERNAL_VALUES 3 | .704 |
| v9intac3 | <--- | INTERNAL_VALUES 3 | .770 |

**Squared Multiple Correlations: (Default - Default model)**

| | Estimate |
|---|---|
| v9intac3 | .594 |
| v7extse3 | .496 |
| v1extbe3 | .519 |
| v3extre3 | .757 |
| v5extre3 | .482 |
| v4intfu3 | .638 |
| v8intre3 | .513 |

**Correlations: (Group number 1 - Default model)**

| | | | Estimate |
|---|---|---|---|
| EXTERNAL_VALUES 3 | <--> | INTERNAL_VALUES 3 | .301 |

**Exhibit 0.62: Scalars for Internal Values at $T_1$**
**(*Non-Entrepreneurs*)**

**Discriminant Validity**: The construct correlation between Internal Values and External Values at $T_3$ for the Non-Entrepreneur Group is 0.301. To calculate the extent to which the Internal and External Values constructs are empirically distinguishable (that is, determining their discriminant validity) involves examining the pattern coefficients (these are the standardised regression weights generated by AMOS) and structure coefficients (these need to be calculated by multiplying the latent factor loading by the factor loading of each item) of each of the two constructs (Cunningham, 2008). These are summarised in Exhibit 0.63. Inspection of the structure coefficients for both the Internal Values and External Values factors demonstrates a clear distinction between the items comprising the respective factors and the remaining items. Hence, it can be concluded that the two factors display discriminant validity.

| Indicator Variables | Internal Values3 | | External Values3 | |
|---|---|---|---|---|
| | Pattern | Structure | Pattern | Structure |
| v5extre3 | 0* | 0.209 | 0.694 | **0.694** |
| v3extre3 | 0* | 0.262 | 0.870 | **0.870** |
| v1extbe3 | 0* | 0.217 | 0.721 | **0.721** |
| v8intre3 | 0.717 | **0.717** | 0* | 0.216 |
| v4intfu3 | 0.799 | **0.799** | 0* | 0.240 |
| v7extse3 | 0* | 0.212 | 0.704 | **0.704** |
| v9intac3 | 0.770 | **0.770** | 0* | 0.232 |

Note: Tabled values are standardised parameter estimates. Asterisked values are parameters fixed to identify the model.

**Exhibit 0.63: Factor Pattern & Structure Coefficients for Internal Values and External Values @ $T_3$ *(Non-Entrepreneurs)* (Adapted from Cunningham, 2008)**

**Model Fit**: Exhibit 0.64 presents the Non-Entrepreneur Group Model Fit statistics for the Internal and External Values measurement model at $T_3$. These indicate to what extent the model "fits" the data. Since the analysis of the External Values construct has previously demonstrated model fit, to the extent that the statistics below are within the acceptable levels, the greater the indication of model fit for Internal Values. Since all results are within the acceptable levels, there is good indication of model fit. This also confirms construct validity of the Internal Values construct dimension at $T_3$.

| Model Fit Index | Model Fit Results | Acceptable Levels |
|---|---|---|
| Chi-square | $\chi^2$ = 2.743 with 13df and p = 0.999 | p > 0.05 |
| Standardised Root Mean-square Residual (SRMR) | SRMR = 0.0192 | SRMR < 0.06 |
| Root Mean-Square Error of Approximation (RMSEA) | RMSEA = 0.000<br>PCLOSE = 1.000<br>LO 90 = 0 | RMSEA < 0.05<br>PCLOSE > 0.05<br>LO 90 = 0 (Exact fit) |
| Tucker-Lewis Index (TLI) | TLI = 1.066 | TLI > 0.95 |
| Comparative Fit Index (CFI) | CFI = 1.000 | CFI > 0.95 |

**Exhibit 0.64: Model Fit Statistics for Internal & External Values Measurement Model at T3 (*Non-Entrepreneurs*)**

# Appendix 5
# List of Publications Flowing From Research

## Academic Journals

Lindsay, N.J., **Lindsay, W.A**., Jordaan, A., and Mapunda, G. (2007). Indigenous nascent entrepreneur self-efficacy and perceived personal success. International Journal of Entrepreneurship and Small Business, Vol. 4, No. 5, pp. 605-619.

Lindsay, N.J., **Lindsay, W.A**., Jordaan, A., and Hindle, K. (2006). Opportunity recognition attitudes of nascent Indigenous entrepreneurs. *International Journal of Entrepreneurship and Small Business*, Vol. 3, No. 1:56-75.

## Conference Papers

**Lindsay, W.A**. and Lindsay, N.J. (2012). Gender moderating effects on entrepreneurial attitude, intention, and start-up behaviour in nascent entrepreneurs, *ACERE/Diana Conference*, February, Fremantle.

**Lindsay, W.A**., Lindsay, N.J., Jordaan, A., and Kropp, F. (2011). Gender differences in family and non-family business nascent necessity entrepreneurs, *Babson College Entrepreneurship Research Conference 2011*, Syracuse, New York, USA, June.

Lindsay, N.J., **Lindsay, W.A**., Kropp, F., and Jordaan, A. (2010). Do what nascent entrepreneurs think others think influence business start-up intentions and behavior: A longitudinal study, *Babson College Entrepreneurship Research Conference 2010*, IMD, Lausanne, Switzerland, June, 2010.

Lindsay, N.J., **Lindsay, W.A**., and Jordaan, A. (2010). Identifying nascent entrepreneurs who follow through, Abstract, *7th AGSE International Entrepreneurship Research Exchange 2010*, Coolum, University of the Sunshine Coast, February.

Lindsay, N.J., **Lindsay, W.A**., and Kropp, F. (2009). Start-up intentions and behavior of necessity-based entrepreneurs: A longitudinal study. *Frontiers of Entrepreneurship Research*, Babson College, Wellesley, MA, USA.

Lindsay, N.J., **Lindsay, W.A**., Kropp, F., and Jordaan, A. (2009). Entrepreneurial empowerment and wellbeing in Indigenous nascent entrepreneurs and non-entrepreneurs, Abstract, *6th AGSE International Entrepreneurship Research Exchange 2009*, Adelaide, The University of Adelaide.

**Lindsay, W.A**., Lindsay, N.J., and Kropp, F. (2008). Values, attitudes, and start-up intentions of necessity-based nascent entrepreneurs. Interactive Paper Session, *Babson College Entrepreneurship Research Conference 2008*, University of North Carolina at Chapel Hill, USA, 4 – 7 June, 2008.

**Lindsay, W.A**., Lindsay, N.J., Jordaan, A., and Dottore, A. (2008). Values, entrepreneurial attitudes, and start-up intentions of Indigenous South African nascent entrepreneurs. *Proceedings of the 5th AGSE International Entrepreneurship Research Exchange 2008, Melbourne, Swinburne University of Technology, Australia, February.*

**Lindsay, W.A**., Lindsay, N.J., and Jordaan, A. (2007). Investigating the values - entrepreneurial attitude - opportunity recognition relationship in nascent entrepreneurs. *Regional Frontiers of Entrepreneurship Research 2007*, Vol. 4:562-575.

**Lindsay, W.A**., Lindsay, N.J., Jordaan, A., and Hancock, G. (2007). Exploring the Values - Entrepreneurial Attitude Relationships of Necessity-Based Nascent Entrepreneurs. *The 13th Academy of Marketing Science World Marketing Congress*, Verona, Italy, 11-14 July, 2007.

Lindsay, N.J., Jordaan, A., and **Lindsay, W.A**. (2005) Values and entrepreneurial attitudes of nascent entrepreneurs. *Proceedings of the 50th International Council for Small Business Conference*, Washington DC, USA, June.

Lindsay, N.J., **Lindsay, W.A**., Jordaan, A., and Hindle, K. (2005). Toward an holistic and inclusive theory of opportunity recognition behavior: Do nascent Indigenous entrepreneurs perceive opportunities differently? *Regional Frontiers of Entrepreneurship Research 2005*, Vol. 2:278-298.

Lindsay, N.J., Jordaan, A., and **Lindsay, W.A**. (2004). Entrepreneurship as the way of the future for South Africa: Toward a theory of entrepreneurial attitude orientation of nascent Indigenous entrepreneurs. *Proceedings of the 2004 SEAANZ Conference*, QUT, Brisbane, Australia, September. (Nominated as a best paper candidate.)