Development of an integrated career anchor preferences, career interests and abilities measure for career path congruence

by

HERMANUS LOUIS ROYTHORNE-JACOBS

submitted in accordance with the requirements
for the degree of

DOCTOR OF PHILOSOPHY

In the subject

PSYCHOLOGY

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: Prof M. Coetzee

November 2019

DECLARATION

I, Hermanus Louis Roythorne-Jacobs, student number 6424287, declare that this thesis, entitled **Development of an integrated career anchor preferences, career interests and abilities measure for career path congruence,** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originally checking software and that if falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

I further declare that ethics clearance formed part of the internal procedures of the Bureau of Market Research, University of South Africa who assisted in conducting the survey. Permission and informed consent were obtained from the participating organisation and respondents for the qualitative study. I also declare that both the quantitative and qualitative studies of the work have been carried out in strict accordance with the Policy for Research Ethics of the University of South Africa (Unisa). I took great care that the research was conducted with the highest integrity, taking into account Unisa's Policy for Infringement and Plagiarism.

Hermanus Louis Roythorne-Jacobs

Student no: 6424287

22 November 2019

ACKNOWLEDGEMENTS

To my best friend and companion, Sandy, thank you for your unconditional motivation, friendship and support. You stood by me for the duration of this milestone in my life. This would not have been possible without your devoted support.

Prof Melinde Coetzee, thank you for your guidance, support and your gift to inspire. You have been and will always be an inspiration to me on my journey through life.

Alexa Barnby, thank you for the language and technical editing, especially your constructive and valuable feedback and input.

I also wish to thank all others who contributed to the completion of this study, especially all participants in the quantitative and qualitative study and trust the research contributes towards more effective career development in practice.

ABSTRACT/SUMMARY

DEVELOPMENT OF AN INTEGRATED CAREER ANCHOR PREFERENCES, CAREER INTERESTS AND ABILITIES MEASURE FOR CAREER PATH CONGRUENCE

by
H. L. Roythorne-Jacobs

SUPERVISOR: Prof. M. Coetzee
DEPARTMENT: Industrial and Organisational Psychology
DEGREE: PhD in Psychology (Industrial and Organisational Psychology)

The research focused on individual–organisational career path congruence and the development of an integrated measure (I-PIA-M) constituting individual variables (i.e. career anchor preferences, career interests and abilities) which are recognised as influencing individuals' perceptions of fit with the organisation. The research adopted a mixed-methods approach: (1) principles and constructs of person–environment (P-E) fit were applied, both to develop the I-PIA-M and empirically test the measure for reliability and validity; and (2) a qualitative study (career intervention) was conducted in which the empirically tested measure was applied in a career counselling context, to assess and guide career path congruence in an authentic work setting. The quantitative study involved a randomly selected sample (N = 270) of predominantly working adults in the economic and management sciences fields. The qualitative study involved five respondents in a career construction interview, along with the administration of the empirically tested I-PIA-M measure. Exploratory factor analysis and confirmatory factor analysis confirmed the multi-dimensionality of the I-PIA-M, and the reliability and construct validity of the scale. The results showed that race and gender significantly explain individuals' self-perceived career anchor preferences and career interests, but not their self-perceived abilities. Age did not significantly explain individuals' self-perceived career anchor preferences, career interests or abilities. The qualitative study corroborated the multi-directionality of individuals' career paths and the notion of guiding person–organisation career path congruence by means of the I-PIA-M. The research contributed to career psychology and career counselling practice through the empirical testing and application of the I-PIA-M in the contemporary work context. Various limitations and recommendations for further research were also highlighted in this thesis.

KEY TERMS: Abilities; career anchor preferences; career construction; career interests; career path; career path congruence; life-design; person–environment fit

ABSTRAK/OPSOMMING

ONTWIKKELING VAN 'N GEÏNTEGREERDE MAATSTAF VIR LOOPBAANANKERVOORKEURE, LOOPBAANBELANGSTELLINGS EN -VERMOËNS VIR LOOPBAANKONGRUENSIE

deur
H. L. Roythorne-Jacobs

TOESIGHOUER: Prof. M. Coetzee
DEPARTEMENT: Bedryf- en Organisasiesielkunde
GRAAD: PhD in Sielkunde (Bedryf- en Organisasiesielkunde)

Die navorsing het gefokus op individuele-organisatoriese-loopbaankongruensie en die ontwikkeling van 'n geïntegreerde maatstaf (I-PIA-M) bestaande uit individuele veranderlikes (bv loopbaanankervoorkeure, loopbaanbelangstellings en vermoëns) wat erken word as faktore wat individue se persepsies van passing met die organisasie beïnvloed. Die navorsing het 'n gemengdemetode-benadering gevolg: (1) beginsels en konstrukte van persoon-omgewing is toegepas om sowel die I-PIA-M te ontwikkel en die maatstaf empiries vir betroubaarheid en geldigheid te toets; en (2) 'n kwalitatiewe studie (loopbaanintervensie) is onderneem waarin die empiries getoetsde maatstaf in 'n loopbaanberadingskonteks gebruik is om die loopbaanpadkongruensie in 'n outentieke werksituasie te evalueer en te lei. Die kwantitatiewe studie het 'n ewekansig geselekteerde steekproef (N = 270) van oorwegend werkende volwassenes op die terrein van ekonomiese en bestuurswetenskappe betrek. Die kwalitatiewe studie het vyf respondent in 'n loopbaankonstruksie-onderhoud betrek, saam met die aanwending van die empiries getoetse I-PIA-M maatstaf. Verkennende faktoranalise en bevestigende faktoranalise het die multidimensionele aard van die I-PIA-M bevestig, en die betroubaarheid en konstrukgeldigheid van die skaal. Die resultate het getoon dat ras en geslag beduidend individue se self-vermeende loopbaanankervoorkeure en loopbaanbelangstellings verklaar, maar nie hul self-vermeende vermoëns nie. Ouderdom het nie beduidend individue se self-vermeende loopbaanankervoorkeure, loopbaanbelangstellings of vermoëns verklaar nie. Die kwalitatiewe studie het die multidireksionele aard van individue se loopbaanpaaie en die idee dat persoon–organisasie-loopbaanpadkongruensie deur middel van die I-PIA-M gerig word, gestaaf. Die navorsing het tot loopbaansielkunde en loopbaanberadingspraktyk bygedra deur die empiriese toetsing en toepassing van die I-PIA-M in die kontemporêre werkkonteks. Verskeie beperkings en aanbevelings vir verdere navorsing is ook in hierdie tesis uitgelig.

SLEUTELTERME: Vermoëns, loopbaanankervoorkeure; loopbaankonstruksie; loopbaanbelangstellings; loopbaanpad; loopbaanpadkongruensie; lewensontwerp; persoon-omgewingspassing

IQOQA

**UKUTHUTHUKISWA KOHLELO OLUHLANGENE LOBIZO LOMSEBENZI OLWENYULWAYO,
LOBIZO LOMSEBENZI OLUTHANDWAYO KANYE NEZINYATHELO ZAMAKHONO
APHOKOPHELELE UMKHAKHA OTHILE WOBIZO LOMSEBENZI**

**Ibhalwe ngu
H. L. Roythorne-Jacobs**

UMELULEKI: Prof. M. Coetzee

UMNYANGO: ISayikholoji yezeZimboni kanye neziNhlangano

IZIQU: ze-PhD kwiSayikholoji (ISayikholoji yezeZimboni neyeZinhlangano)

Ucwaningo lugxile kuhlelo olufanayo lobizo lomsebenzi olulandelwa umuntu ngamunye–yinhlangano kanye nokuthuthukiswa kwendlela ehlangene yokwakha izimpawu zomuntu ezahlukahlukene (I-PIA-M) (zona yilezi ukwenyulwa kobizo lomsebenzi oluyinsika, ubizo oluthandayo lomsebenzi kanye namakhono okwenza umsebenzi) ezithathwa njengalezo ezinomthelela phezu kwemiqondo yomuntu ohambelana ncimishi nenhlangano. Ucwaningo lwamukela ingxubevange yezindlela zokwenza ucwaningo: (1) imigomo kanye nezakhiwo zesizinda somuntu (P-E) zisetshenziswe, kabili, ukwakha i I-PIA-M kanye nokuhlolwa ngendlela ephathekayo izinga lokwethembeka kanye nokulunga; kanye; kanye (2) nocwaningo olusebenzisa amagama lwenziwa, lapho isinyathelo sokuhlola esiphathekayo sasetshenziswa kuhlelo ngaphansi kwesizinda sokululekwa ngokobizo lomsebenzi, ukuhlola ikhono kanye nokukhombisa umfundi indlela yobizo lomsebenzi ehambisana naye angayilandela ngaphansi kwesimo sangempela somsebenzi. . Lesi sifundo socwaningo besixuba isampuli yokukhethwa ngokungahleliwe kwabantu abadala (N = 270) abasebenzayo emikhakheni yezesayensi yezomnotho kanye nezokuphata. Uhlelo locwaningo olusebenzisa amagama luye lwaxuba abaphenduli abahlanu kunhlololwazi lokuzakhela ubizo lomsebenzi, kanye nokuqhutshwa kwesinyathelo sokuhlolwa okuphathekayo kohlelo lwe-I-PIA-M. -. Uhlelo lokuhluza oluvumbululayo kanye nohlelo lokuhluza oluqinisekisayo aye aqinisekisa ukwehlukahluka kwe-I-PIA-M ngokwezigaba, nokwethembeka kanye nohlelo lwesakhiwo esifanele sobukhulu. Imiphumela iye yakhombisa ukuthi ubuhlanga kanye nobulili zichaza kahle kakhulu ubizo lomsebenzi olukhethwa, ubizo lomsebenzi othandwayo noma amakhono omsebenzi athandwayo, kodwa hayi ngokuzikhethela komuntu ngokwamakhono anawo. Unyaka awuzange ucacise kahle ukwenyula ubizo lomsebenzi, ukuthanda ubizo lomsebenzi kanye namakhono omsebenzi ngokuzazi komuntu ngokwakhe. Unyaka, ubuhlanga kanye namaqembu obulili akhombise umehluko omkhulu mayelana nobizo lwemisebenzi abalwenyulayo, ubizo lwemisebenzi abayithandayo kanye namakhono omsebenzi abawaqondayo ngokuzazi kwabo. Ucwaningo olususelwa kumagama lusekela uhlelo lwezindlela eziningi lwezindlela zobizo lomsebenzi ezilandelwa ngabantunkanye nombono wokuholela umuntu-inhlangano endleleni efanayo yobizo lomsebenzi ngokusebenzisa uhlelo lwe-I-PIA-M. Ucwaningo luye lwaba negalelo kusayikholoji kanye nasemisebenzini wokweluleka ngokobizo lomsebenzi ngokusebenzisa uhlelo oluphathekayo lokuhlola kanye

nokusetshenziswa kohlelo lwe-I-PIA-M kwisimo sanamuhla sasemsebenzini. Kuye kwavezwa imingcele eyahlukahlukene kanye nezinqumo ezimayelana nokwenza olunye ucwaningo oluqhubekayo kuye kwavezwa kule thesisi.

AMAGAMA ASEMQOKA: Amakhono, ukwenyula ubizo lomsebenzi, ukwakhiwa kobizo lomsebenzi, ubizo lomsebenzi oluthandwayo, indlela oyilandelayo yobizo lomsebenzi, indlela yobizo lomsebenzi ehambisana nomfundi/nenhlangano, ukwakha uhlobo lwempilo, indawo yomuntu.isizinda esifanele umuntu.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

SCIENTIFIC OVERVIEW OF THE RESEARCH

This research focuses on developing an integrated career assessment measure constituting career anchor preferences, career interests and abilities in order to guide individual–organisational career path congruence. The chapter provides the background to and the rationale for the study and formulates the problem statement and research questions. On the basis of these, the aims of the research are then stated. The paradigm perspectives that guide the research are discussed, while the research design and method together with their different steps, which give structure to the research process, are formulated. The layout of the chapters is then indicated, followed by a chapter summary.

1.1 BACKGROUND AND RATIONALE FOR THE RESEARCH

This section will provide the background to the study and clarify the rationale for the research.

1.1.1 Background

The context of the current research is contemporary organisational career management and development with a specific focus on person–organisation career path congruence in the South African multicultural organisational context. More specifically, the research focuses on person or individual-organisational career path congruence and the development of an integrated measure constituting individual variables (i.e. career anchor preferences, career interests, and abilities) recognised to influence individuals' perceptions of fit with the organisation. The development of the integrated measure (referred to as the Integrated Career Preferences, Interests and Abilities Measure: I-PIA-M) ultimately focuses on contributing to career guidance and counselling practice for enhanced person-organisation career path congruence in the contemporary organisation. In this regard, the research adopted a mix-method approach: (1) the research focused on principles and constructs of person-environment (P-E) fit in order to develop an integrated measure that can be empirically tested for reliability and validity; and (2), the research focused on a qualitative study (career intervention) in which the empirically tested measure was applied in the career counselling context for assessing and guiding career path congruence in an authentic work setting. According to Su et al. (2015), in the context of career intervention, P–E fit or congruence is essential for career planning, decision-making and adjustment. In fact, mere knowledge about P–E fit theories assists clients in understanding and solving career-related issues. Assessment of theoretically

relevant constructs pertaining to the individual and the environment is a key part of career guidance from the P-E fit perspective, because the results are incorporated into counselling to assist clients in their career development (Su et al., 2015).

In the context of the present research, *person-organisation career path congruence* refers to the alignment between (1) individuals' career anchor preferences, career interests, and perceived abilities, and (2) organisational expectations as represented by the world of work career maps (i.e. categorisation of occupations into career areas based on the grouping of similar job types in the organisation: Prediger, 2002) and the RIASEC occupational categories of Holland (Gottfredson & Holland, 1996; Holland, 1997). P-E fit theories (Van Vianen, 2018) highlight the RIASEC personality profiles and corresponding organisational occupational types (realistic, investigative, artistic, social, enterprising, and conventional) as an important principle in understanding person-organisation fit satisfaction. In terms of the present study, the RIASEC framework of Holland (Gottfredson & Holland, 1996; Holland, 1997) was used as foundation for developing the items for the career interests and abilities constructs of the I-PIA-M. Schein's (2006) career orientations inventory was integrated in the I-PIA-M as a measure of career anchor preferences.

The notion of person-organisation career path congruence in the context of person-environment congruence (Van Vianen, 2018) will be discussed in more detail under the TWA/P-E Correspondence theory discussion in chapter 3.

In this study, the term "congruence" is preferred to the classical term "fit" based on the premise that perfect fit seldom exists (Van Vianen, 2018). Person-environment congruence, in the context of person-career and person-organisation congruence will be discussed in more detail under theory of TWA/P-E Correspondence in chapter 3.

Individual–organisational career path congruence is guided by the theoretical relationship between career anchor preferences, career interests and abilities, and therefore an understanding of the notion of person–environment (P-E) fit, and the three foci of person-vocation fit, person-job fit and person-organisation fit is important. All P-E fit theories share the following assumptions (Su, Murdock, & Rounds, 2015): people seek out and create environments that allow them to behaviourally manifest their personality traits, interests, preferences and abilities; and the extent to which people fit their work environments has significant consequences or outcomes (e.g., satisfaction, performance, stress, productivity, turnover), with better fit or congruence being

associated with better outcomes. A central thesis in P-E fit theories is that comparisons between an assessment of the individual and an assessment of his or her environment can predict positive workplace performance outcomes (Nye, Su, Rounds, & Drasgow, 2017).

Person-vocation fit theory (Holland, 1997; Schein, 1990) alludes to the notion that individuals are drawn to work environments in which they can express their interests and career anchor preferences. The theory of person-job fit (TWA: Dawis & Lofquist, 1993)/P-E correspondence (Dawis, 1996; 2005) argues that a satisfying job is the result of individual and organisational attributes being commensurate (i.e. there is correspondence between a person's abilities and the demands-abilities of the career area/job type; the individual and environmental attributes belong to similar conceptual domains that are logically related to, and interdependent on one another) (Van Vianen, 2018). The TWA /P-E correspondence (Dawis & Lofquist, 1993; Dawis, 1996; 2005) consists of two models (Swanson & Schneider, 2013): (1) the predictive model, focusing on the variables that explain whether individuals are satisfied with their work environments, which in turn predicts tenure in their work environments; and (2) the process model, focusing on how the fit between individuals and their environments is attained and maintained. Both the TWA/P-E correspondence and Holland's theory evolved within the discipline of vocational psychology yet share a conceptual foundation within the broader study of P-E fit psychology (Swanson & Schneider, 2013). This is important for understanding how an individual's career anchor preferences, career interests and abilities align to organisational career paths. According to TWA/P-E correspondence theory, employees and work environments are seen as having a reciprocal relationship that jointly affects tenure (i.e. length of employment). Occupations require employees to have certain abilities, and employees expect occupations to supply 'reinforcers' (rewards) that meet certain needs (the pattern of which reflects their work values) (Su et al., 2015). 'Correspondence' (or fit) between a job and a job holder is high when an employee meets or exceeds the abilities demanded by a job or a job meets or exceeds the needs of an employee (Su et al., 2015).

Person-organisation fit refers to the compatibility between individual and work environment characteristics (Kristof-Brown & Guay, 2011). When job characteristics and occupational types/career pathways are aligned with employees' personal needs and abilities, employees are most likely to experience good person–job and person-organisation fit (Kristof-Brown et al., 2005). This supports the notion of Caplan (1987) that P-E fit theory represents a mechanism for understanding the process of adjustment between organisational members and their work environments in order to achieve optimal congruence for reciprocal satisfaction. According to

Caplan (1987), various needs exist to better understand adjustments in organisations, of which one need is to assess the characteristics of the person and of the environment along commensurate dimensions. A second property is the importance of distinguishing between objective and subjective measures of fit and their components, making it possible to define accuracy of perception as a discrepancy between objective and subjective fit. A third property is the distinction between fit defined in terms of abilities–environmental demands (Caplan, 1987). Abilities–environmental demands refer to the extent that the employee's knowledge, skills and abilities are commensurate with what the job requires (e.g. project deadlines, quality standards) and the socially constructed requirements (e.g. role expectations, behavioural norms) that are placed on the person (Kristof-Brown et al., 2005; Yu, 2016). Abilities include the knowledge, skills, energy and other personal resources that the individual can draw upon to meet these demands. In addition, needs–supplies (N–S) fit is the second type of complementary fit and refers to the fit between individual needs and the ability of the environment to fulfil those needs (Yu, 2016).

Career anchor preferences are represented by Schein's (1990) career anchors framework, which serves as a guide for individuals when making career decisions. Like personality, career anchors are relatively stable from the age of 30 years (Leong, Rosenberg, & Chong, 2014). The underlying hypothesis of Schein's career anchors theory is that individuals will be most satisfied and productive when there is a fit between their career anchor preferences and their jobs (Leong et al., 2014; Schein, 1985; 1990). In terms of career interests, Holland (1985; 1997) claims that professional satisfaction, diligence and success depend on the congruence between an individual's personality (i.e. preferences and interests) and their occupation or field of studies.

According to Barclay, Chapman, and Brown (2013), Schein's (1990) career anchor theory made a significant contribution to the way career scholars conceptualise the development of a stable career identity, while helping individuals and organisations alike to understand the value of 'fit' in career success. Career anchors relate to individuals' internal (subjective) careers and reflect the preferred goals and values they hold in relation to their working lives and the criteria for success by which they judge themselves (Coetzee & Schreuder, 2014) and which guide their attitudes throughout the development of their careers (Aydogmus, 2018). A career anchor can be defined as "a combination of perceived areas of competence, motives, and preferred values that you would not give up; it represents your real self" (Schein, 1990, p. 1).

The term "career anchor preferences" is therefore use in the context of the present study. According to Schein (1990), regardless of one's current job or career, future decisions will be

easier and more valid if there is a clear understanding of one's own preferred orientation to work, motives, values, and self-perceived talents. In the present study the term "career anchor preferences" is adopted to refer to the preferred or dominant career orientations as measured by Schein's (1990; 2006) career orientations inventory.

Schein (1996) agreed that intrinsic motivated employees are crucial to an organisation's success, and therefore understanding people in terms of their jobs and what motivates them could be a driving force in strengthening organisational commitment. Individuals make career choices based on inner life values and derive satisfaction from their own career anchor preferences (De Vos & Van der Heijden, 2015). A study conducted by Bezuidenhout, Grobler, and Rudolph (2013) focused on understanding the fit of individuals' internal career needs (aspirations) with their jobs, based on Schein's career anchors. A study by Bezuidenhout et al (2013) used, for example, Schein's career anchor preferences or orientations in support of career conversations to determine the career aspirations of employees within an open distance education and learning environment. In its conclusion, the study (Bezuidenhout et al., 2013) found that career paths can be structured and mapped using Schein's career anchor preferences in a constructive succession plan at the highest levels of the organisation.

Interests are viewed as relatively stable dispositions that facilitate fit (e.g. congruence) between people and their environments (Van Vianen, 2018). However, because an individual develops traits over time, interests may change accordingly. Interests are also contextualised by individuals in the sense that the individual will consider a work environment and/or activity of interest and will tend to explore careers based on his or her understanding of the environment and/or activity (Van Vianen, 2018). This premise formed a critical component of Holland's (1997) theory of personality and vocational types. Another feature of career interests represents the motivational value of interests. Interests affect the direction and persistence of the goal-oriented behaviour that an individual displays towards realising career goals. As such, interests are expected to predict career goal attainment from both an educational and a workplace perspective. Classical models of vocational guidance and career counselling, which are designed to support clients in finding a good match between their fixed personal characteristics (e.g. vocational interests and personal skills) and work environments or occupations, are deemed insufficient in that they are, on their own, no longer able to provide a comprehensive understanding of the complexity of today's job market (Ginevra, Annovazzi, Santilli, Di Maggio, & Camussi, 2018).

Among all vocational theories, Holland's (1997) theory of personality and vocational types focuses most explicitly on interests (Hansen, 2013; Nauta, 2013). According to Hansen (2013) and Nauta (2013), Holland's theory provides a comprehensive model of vocational interests and their relationship to career decision-making, satisfaction and performance. Recent meta-analyses have indicated that congruence between an individual's interest profile and workplace environments can predict positive performance results (Nye, Butt, Bradburn, & Prasad, 2018). Interest congruence also provides a framework for integrating higher order abilities, personality, values, interests and needs, and to describe interests relative to people, work environments and job tasks (Hansen, 2013). According to Holland (1973), career interests are primarily used to predict individuals' initial career choices (and not speciality choices). Career interests are associated with career anchor preferences because both anchor preferences and interests are stable constructs stemming from individual personalities and identities. A study conducted by Leong et al. (2014) reported strong interrelatedness between the factors of Schein's career anchor preferences and Holland's (1973) personality and vocational type theory. This study will also consider the role of Holland's (1973) theory and will include references to correlations between Holland's (1973) theory and Schein's (1990) career anchors framework. As such, it is essential for the aims of this study to gain an understanding of the role of career anchor preferences, in addition to career interests and abilities, in the context of the development of an integrated preference, career interests and abilities measure for guiding career path congruence in career counselling.

Researchers investigating vocational behaviour have found that ability judgements – one's evaluation of one's abilities and the impact of mental or physical capacity to complete a specific activity or task – play a central role in the development of vocational interests, career exploration and career choice (Bubany & Hansen, 2010; Metz & Jones, 2013; Snow, 1994). For the purposes of this research, abilities will be regarded as self-perceived abilities based on the self-evaluation of individuals' abilities identified through a self-assessment questionnaire related to various career fields. Alignment of one's own values, interests, knowledge, skills and abilities to enhance employability promotes person–organisation career alignment (Callanan et al., 2017). De Lange, Kooij, and Van der Heijden (2015) assume that the work ability of workers will become sustainable if their (future) physical and cognitive capacity as well as personal needs and interests are congruent with aspects and (future) requirements of their current (and future) work environment.

1.1.2   Rationale for the research

Contemporary careers are characterised by flexibility and self-directedness on the part of the individual (Hirschi, Herrmann, & Keller, 2015; Wesarat, Sharif, & Majid, 2014) and careers are physically and psychologically independent from organisations (Rodrigues, Butler, & Guest, 2019). According to Wesarat et al. (2014), the effective management of career development fosters personal career growth and organisational competitive advantage. The management of career development in terms of P-E fit or career path congruence within the organisation promotes individual capability to develop a career in the workplace and provides organisations with the ability to respond proactively to changing organisational environments (Wesarat et al., 2014).

Albeit much strides have been made in the contemporary career guidance profession to accommodate career path congruence, individual and organisations face various challenges when dealing with person-work environment fit relevant to career path congruence. A study conducted by Perdue, Reardon, and Peterson (2007) investigated the role of P-E congruence, self-efficacy, and environmental identity in relation to job satisfaction in the context of a career decision-making theory perspective. In terms of career decision-making theory, the following three critical factors related to P-E correspondence, as stated in Perdue et al. (2007), have an impact on person–organisation and career path congruence: What is the match between my interests and the job that I am considering? Do I believe I have the ability and self-confidence to perform the work? Do I perceive the mission, rules, and vision of the organisation to be consistent and clear?

From an individual's perspective, the current environment is characterised by accelerated modernisation, leading to an enormous increase of changing and evolving occupation paths, career specialisations, study fields and professional training, and types of jobs (Gati & Levin, 2014). What has become critical in career counselling practice is not to guide individuals towards the 'right' decision, but to help them to overcome the difficulties that impede their decision-making and which are often associated with perceptions of fit or misfit (Gati & Levin, 2014; Van Vianen, 2018). Research infers that individuals and organisations face various challenges in the context of the person–work environment fit relevant to career path congruence. As indicated by Gati and Levin (2014), individuals are faced with an environment characterised by accelerated modernisation, an increase in occupation paths, career specialisations and various types of jobs, leading to career paths becoming far less predictable, demanding flexibility from individuals.

From an organisational perspective, career management faces various challenges to accommodate individual-organisation career path alignment or P-E fit. It is critical in the modern-day organisation to provide individuals with opportunities to plan and grow careers within the context of the contemporary work environment. This is supported by research indicating that organisations that want to retain valuable employees should try to establish favourable organisational conditions and human resource practices that will address the differing career needs of a diverse workforce (Coetzee & Gunz, 2012; Coetzee & Schreuder, 2008; Kniveton, 2004; McNeese-Smith & Van Servellen, 2000,; Van Vianen, 2018). Oracle (2012), in its white paper on six technology-based best practices related to talent retention, states that employees want opportunities and career growth in their organisation to enable them to create focused and dynamic career plans to pursue careers inside the organisation rather than outside. As such, organisations should establish integrated career management tools to embrace employee mobility through lateral redeployment, as well as internal promotions, based on human resource best practices (Oracle, 2012). According to Oracle (2012), this should include self-service career planning tools, career paths based on actual career history (ability to analyse job-related data in the context of organisational career pathways), and empowering employees to find and engage mentors. In an article entitled "Turning the tide: Registered nurses' job withdrawal intentions in a Finnish university hospital", Hanna Salminen (2012) examines the job withdrawal intentions of younger and ageing nurses and the factors associated with job withdrawal intentions with special reference to job control and perceived development opportunities. The findings emphasise the importance of monitoring job satisfaction and work ability regularly and offering individuals opportunities to use their skills and abilities and to control their work in order to retain them in their profession (Coetzee & Gunz, 2012; Salminen, 2012). To accommodate person-organisation career path alignment and to promote effective career development opportunities, organisations need to consider, for example, to standardise job titles of similar jobs across functional work areas supported by competence matrix for each job, which provides a blueprint for career path in a given department and the required competencies to fulfil these jobs (Khan, Rajasekar & Al-Asfour, 2015). Career maps (often visualised) are built by the organisation to show what a typical career looks like in terms of sequential positions, roles, and stages based on core competency and expected behavioural requirements (Cao, 2013).

Using the principles of P–E fit or congruence, the current research focuses on the notion of career path congruence, which is seen as the match (or fit/congruence) between an individual's preferences, interests and abilities (person characteristics) and the career pathway of the job

within a particular organisation (environmental characteristics). Traditionally, a *career path* was a sequence of job positions, usually related in work content, through which employees moved during the course of their careers (Greenhaus, Callanan, & Godshalk, 2010). According to Greenhaus et al. (2010), contemporary approaches to career pathing focus on similarity in required job behaviours, knowledge and skills requirements, involving analysis of job content, grouping of similar jobs into 'job families' and identifying logically possible paths of progression among these job families. In practice, career pathing refers to the process of outlining an individual's career development plan in an organisation, making provision for predetermined steps along the career path to promote career growth opportunities towards managing different types of organisational environment and to reach the individual's career goals (Billeh, 2016). To achieve best career path development opportunities, it is important that the process includes self-assessment (exploring level of knowledge, skills and abilities coupled with past experiences, achievements and interests) and defines an appropriate individual career map (i.e. identifying positions in the organisation that correspond with the individual's preferences, interests and abilities profile: Billeh, 2016).

Various models exist to illustrate the application of career path clusters or areas in an attempt to group jobs into a meaningful organisation of career groupings to enable career counsellors to link jobs in the workplace to career pathways. Such models include the world of work map [WWM] (Prediger, 2002); the Minnesota career fields, clusters and pathways chart (Minnesota State Colleges and Universities, 2010); the O*NET System (O*NET Centre, 2007) and the Organisation Framework of Occupations (OFO) 2013 (Coetzee, 2013; Department of Higher Education and Training, 2013). Creating *organisational career pathways* (1) allows employees to understand where they currently fit into the business unit and, more importantly, where they can go in the future if they take the initiative to acquire essential competencies; (2) makes it easy for individuals to see what they need to do to develop themselves to qualify for advancement; and (3) provides managers with a better understanding of what the coaching and other career developmental experiences they should provide their workers with to help them qualify for advancement (Rothwell et al., 2005).

In the career counselling context, having knowledge and understanding of individuals' career profiles (career anchor preferences, career interests and abilities) will assist in matching an individual's profile with the requirements of the particular sequence of career pathways that constitutes a particular career pathway within the company. For example, an individual with a career anchor preference for the entrepreneurial career anchor of Schein, with an interest in the

business environment, and the ability to interpret business-related information, should be able to align to the position of business development manager, providing he or she has the required qualifications, experience and skills set for the position.

Initially, models of career counselling focused on matching individual abilities to job requirements, and this was later expanded to include assessment of career anchor preferences, career interests and abilities (Hansen, 2013; Schein, 1996). As a result, research examining the overlap of interests, personality and cognitive abilities has led to integrative models of the role of individual differences in career counselling (Hansen, 2013).

In this research, the challenge would be to understand the conceptualisation of the constructs of career anchor preferences, career interests, and abilities, the relationships between these three constructs, and how these constructs relate to individual-organisational career path congruence. The study also seeks to ascertain whether the constructs of career anchor preferences, career interests, and abilities may be empirically operationalised into an integrated empirical measure to guide individual–organisational career path congruence in the South African career counselling context.

1.2 PROBLEM STATEMENT

In defining the problem statement, the feasibility of and challenges prompting the research will be discussed.

1.2.1 Feasibility of the study

In the context of the current study, the aim is to investigate the feasibility of an integrated measure that aggregates an individual's career anchor preferences (Schein, 1990; 2006), career interests (Holland, 1997) and self-perceived abilities (Dawis & Lofquist, 1993; Dawis, 1996; 2005) in terms of world of work career pathways and the Holland's (1997) RIASEC occupational categories in the career guidance and counselling context.

In today's more turbulent career context, facilitating P–E fit and/or congruence has become more challenging. Perceptions of discrepancies between the person and the work environment are expected to trigger adaptive responses that can involve both the person and the environment (Ployhart & Bliese, 2006; Van Dam, 2013). That is, employees can try to improve P–E fit by

changing some personal aspects, work environmental aspects, or both (De Vos & Van der Heijden, 2015). P–E fit is faced with the following challenges (Chuang, 2013): multidimensionality of fit (studying fit from only a single dimension is inconsistent with the way individuals experience fit because people are simultaneously nested in multiple aspects of an environment); researchers should also consider the multiple content dimensions (e.g., values, goals, personality, and interests) of each individual dimension of P-E fit. Recent developments in P–E fit research have led to theorisations of fit based on multiple theories (Chuang, 2013). The integration of different fit theories would allow researchers to paint a richer portrait of P–E fit phenomena and investigate the unique effects of each theory on these phenomena (Kristof-Brown & Guay, 2011), involving two or more dimensions of fit. According to Chuang (2013), a third challenge involves simultaneously assessing the contributions of various types of P–E fit (for example: person-vocation fit; person-job fit; person-organisation fit) to the theoretically related outcome constructs.

Research shows that although a challenging concept to consider in today's uncertain and rapidly changing employment context, P–E fit and/or congruence is still an important aspect for individuals' career satisfaction and wellbeing, and how can this be achieved through the alignment of career anchor preferences, career interests and abilities to organisational career pathway offerings. In the context of this research, organisational career pathway offerings will be explored in terms of career pathways, as proposed by various theoretical and industry frameworks. Organisations define career pathways with due consideration of providing a career roadmap to employees, build job profiles, identify core competencies and expected behaviours, and linking career pathways to employee development by prioritising position profile characteristics and identifying key experiences that employees should acquire as they move along the career pathway. Such include the World of Work Map (WWM) (Prediger, 2002); Minnesota career fields, clusters and pathways chart (Minnesota State Colleges and Universities, 2007); the O*NET System (O*NET Centre, 2007) and the Organisation Framework of Occupations OFO 2013 (Department of Higher Education and Training, 2013; Coetzee, 2013).

Research findings by Tims, Derks, and Bakker (2011) suggest that by seeking an alignment between their career anchor preferences, career interests and abilities, and to organisational and job requirements and career pathways, individuals can proactively optimise their person–job fit and, as a consequence, experience their work as meaningful. This is critical for person—career path congruence as individuals will experience greater job and career satisfaction where their career preferences, career interests and abilities are aligned to requirements of corresponding career pathways in the workplace. Past studies have revealed that the existence of congruence

between employees and their job and their organisation produces more favourable attitudes and behaviours (Memon, Salleh, & Baharom, 2015; Van Vianen, 2018). According to Rounds and Tracey (1990), and supported by Wille, Beyers, and De Fruyt (2012), more contemporary perspectives on P–E fit indicate an ongoing process of adjustment, as environments are influenced by individuals and individuals are influenced by environments, which is also postulated by the TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005). On the other hand, organisations need to articulate career paths and find ways to control career path progression.

From an empirical and practice perspective, the research problem relates to whether an integrated model and measure (i.e. the I-PIA-M) can be established that explores and models the relationship dynamics between individuals' career anchor preferences, career interests and abilities profile, and their ideal organisational career path choices. Currently, the three constructs are measured in isolation by different measures. The integrated measure needs to consider organisational career pathways to provide an integrated view of individual career anchor preferences, career interests and abilities and their relevance to organisational career path articulation and progression. The measure will aim to align an individual's career anchor preferences (Schein, 1990), career interests (Holland, 1997) and self-perceived abilities (Dawis & Lofquist, 1993; Dawis, 1996; 2005) into an integrated measure that can be applied in the career counselling context. The purpose would be to more accurately guide congruence between an individual's integrated and/or consolidated profile and current and desired career path types, along with contemporary world of work career path alternatives and models based on educational or academic principles, established research models such as O*NET (2007), the World of Work Map (WWM) (Prediger, 2002) and occupational or job clustering perspectives (Organisation Framework for Occupations, Department of Higher Education and Training, 2013).

Harrington and Long (2013), in reflecting on the history of interest inventories and career assessments in career counselling, foresee a more holistic approach, integrating career interests and ability measures to enhance a more comprehensive approach to career counselling. Burns (2014), in investigating the validity of person matching in vocational interest inventories, emphasised that although occupations can be predicted effectively through inventories, the challenge is to ensure alignment to current vocational constructions. Existing instruments (such as the Strong Interest Inventory [SII], and Self-Directed Search [SDS]) focus on interests and self-perceived abilities (Zarrin, Baghban, & Abedi, 2011). However, owing to the absence of a South African developed inventory the Maree Career Matrix was developed (Maree & Taylor, 2016),

indicating the need for South African based measures that can be applied in the career counselling context. The Maree Career Matrix facilitates, for example, the identification of clients with little or no exposure to the world of careers and/or with little or inadequate understanding of their own interest profiles. It attempts to clarify why certain clients display certain career interests and confidence profiles, helping clients understand their profiles, and motivating them to investigate the world of work actively, as well as expediting psychological research by using it alongside other career inventories and tests to triangulate findings (Maree, 2008; Maree & Taylor, 2016). However, the MCM does not address career path congruence in the work setting context. Interesting though, these measures use as reference point the classical RIASEC framework of Holland (1997).

Athanasou (2011) investigated the advantages and disadvantages of the different inventoried approaches to assessing career interests. According to Athanasou (2011), a presupposition underlying interest assessment is that it reveals individual interests through a person's preferences revealed in circumstances where they may choose freely from potential alternatives. Provision is also made for the fact that alternatives may not yet be available to a person because of their age, socioeconomic disadvantage or other circumstances (Athanasou, 2011). Athanasou (2011) recognises the theoretical assumption that by and large job satisfaction and interest are related, and that people will tend to be good at or value the things they like and not so good at or have less appreciation for the things they don't like.

According to Athanasou (2011), the key presupposition of interest assessment relates to freedom of choice and a person's self-actualisation. This assumes that interest is important for career development as a source of job satisfaction and also because of the link between interest and achievement. As a result, it can be argued that the interpretation of the results from an interest inventory offers clients knowledge about the pattern of their interests and assists career guidance counsellors in understanding a client (Athanasou, 2011).

In discussing the advantages of interest assessment, Athanasou (2011) considers factors related to interest and job satisfaction, lack of predictive validity, challenges with the use of interests in counselling, rating scales and the adding of responses, as well as variable interest categories. In addition, inadequate item sampling, lack of validity and test-retest reliability data, and the use of norm referenced comparisons are also considered.

In examining the advantages and disadvantages of the different inventoried approaches to assessing career interests, Athanasou (2011) considered the following instruments:

- **International:** Ashland Interest Assessment; Career Assessment Inventory – Enhanced Version; Career Assessment Inventory – Vocational Version; Wide Range Interest and Occupation Test – Second Edition; Interest Determination, Exploration and Assessment System; Transition to Work Inventory; Jackson Vocational Interest Survey; Career Occupational Preference System Interest Inventory; Motivated Skills Card Set; Occupational Interests Card Set; Campbell Interest and Skill Survey; Saville and Holdsworth – Advanced Occupational Interest Inventory; General Occupational Interest Inventory; Management Interest Inventory; Strong Interest Explorer; Strong Interest Inventory; Reading-free Vocational Interest Inventory.
- **Australian:** Rothwell–Miller Interest Blank; Vocational Interest Survey for Australia; Vocational Interest Questionnaire; Australian Interest Measure – Short Form; Self-directed Search – Revised (Australian Edition).

For the purposes of this study, various disadvantages/challenges outlined by Athanasou (2011) are deemed important. Firstly, it has been suggested that career interests are useful for career counselling but that their use has also been questioned. The issue of career exploration based on an inventory of interests is not essential nor necessarily the best option. One could simply ask a person to rank some career fields and then exclude those areas that are disliked. While there is considerable literature on the technical aspects of interest assessment, there is very little research on the ways to use interest results. Secondly, most interest inventories rely on scores but the scores do not represent units of interest. In fact, there are no units of interest measurement in the sense that there are kilometres, kilograms and kilojoules. The ratings on the various questions are not additive – that is, one cannot add a response from one item to another. There are also response-style effects that influence the results of interest assessment with summated ratings or Likert-type scales. For example, some people will give very few high ratings to items and they will end up with low overall scores on the categories, whereas others may indicate a positive rating for many items and end up with high interest scores across all categories. A major disadvantage, then, is that the scores do not represent meaningful quantities. Furthermore, there is the very real problem that each interest questionnaire seems to have its own classification; there is no standardisation whatsoever and this is an indictment of a field that purports to call itself a profession. Of course, most of these problems can be resolved by the Holland classification but

even this is artificial. Moreover, the categories are often not representative of the workforce. In the Australian context, outdoor occupations and unskilled activities are extremely important yet they are subsumed by Holland's generic Realistic category. Lastly, a further disadvantage is that many interest inventories are far too short to adequately sample the world of work. Just how many items of activity preference should be sampled? If one wanted to know whether someone was interested in scientific occupations and there were 160 of them in total, then one would need a sample of 113 in order to be able to say with 95% confidence that someone preferred a given percentage (plus or minus 5%) in a category. For the purposes of this study, the advantages/characteristics and limitations of various career interest inventories are discussed below. Existing instruments deemed critical in this regard include the Campbell Interest and Skill Survey (CISS) (Campbell, 2002), the Schein's (1996) Career Orientations Inventory (Bravo et al., 2017), and the Self-Directed Search (SDS) (Reardon & Lenz, 1998).

The CISS content domain used for guidance in considering skills items constitutes the domain of vocational interests that has been carved out over the years by the cumulative findings of earlier researchers such as E. K. Strong Jr., L. L. Thurstone, John Holland, and the earlier work on the Strong-Campbell Interest Inventory SCII (Campbell, 1977). The content domain is defined by the five to seven major dimensions of interests that have turned up repeatedly in factor studies of interests over the years. Skills can be measured in the same manner that interests have been measured for some 75 years, and the resulting measurements are related to occupational choices. The standardised measures of self-reported skills appear to track some intertwined combination of the actual skill itself and the participant's sense of self-confidence in carrying out the skill. Donnelly (2009, 2010) investigated the construct validly for the Orientation scales of the CISS in South Africa. Unfortunately, poor model fit was found for both the Interest and Skill Orientation measurement models (Donnelly, 2009, 2010). Donnelly (2009, 2010) reported that in many cases, global (second-order) factors are not the primary level of measurement in this instrument, and practitioners are encouraged to place more interpretative action at the Basic scale level.

In terms of the Career Orientations Inventory (Schein, 1996), Schein defined eight career anchor preferences in terms of abilities, needs and interests, and values. These include the features of work that may be important to individuals as they navigate career choices in a boundaryless career environment. However, the number of possible dimensions that can comprise career orientations remains an empirical question (Bravo et al., 2017), with inconsistent results being found in regard to the number of factors represented by the scale (Feldman & Bolino, 1996). For

15

example, studies reporting exploratory factor analysis of the 40-item scale have revealed a 4-factor solution (Nordvik, 1996), a 9-factor solution (Danziger, Rachman-Moore, & Valency, 2008; Marshal & Bonner, 2003) and an 11-factor solution (Igbaria, Greenhaus, & Parasuraman, 1991). Based on the discussion above, one may conclude that a number of the basic aspects of the career anchor concept are still questioned: How many anchors exist? Can an individual hold more than one anchor? Is one's career anchor stable over time?

Holland (1997) developed what has come to be referred to as the vocational choice theory, which forms part of the wider person–environment (P–E) fit theory that established a linkage between careers and the personality orientations. Holland was of the view that individuals' needs, traits, competence and interests play an important part in determining their careers (Robinson & Betz, 2008). P–E fit provides for an association between the individual's characteristics and their job environment which is meant to bring about positive outcomes for both the individual and the organisation (Gottfredson, & Duffy, 2008). This laid the foundation for the development of the SDS (Holland & Messer, 2013a, 2013b; Reardon & Lenz, 1998). Many studies have been conducted on the reliability and validity of vocational theory as advanced by Holland, with critics claiming that this model adopts a static view. Thus, in this model, stable aspects of the individual and the environment are the main point of focus. In scientific studies, P–E fit can only be assessed at a given point in time when the job choice decision has been made or at a point later on when the individual's tenure at the organisation has been analysed (Gottfredson, & Duffy, 2008). Critics have therefore called for dynamism in the P–E fit theories to make them more plausible. This is in recognition of the fact that in an effort to attain the 'fit', both individuals and their environments are dynamic. Accordingly, either individuals may adjust their environments or themselves to fit well or jobs are bound to change over time, which may result in changes occurring in the correspondence between the individual and the environment (Arnold, 2004). The TWA/P-E correspondence (Dawis & Lofquist, 1993; Dawis, 1996; 2005) is an alternative to Holland's personality and occupational types theory, emphasising individuals' correspondence with their environments, including the notion of person-job ability fit. This is a dynamic approach to P–E fit and contrasts with Holland's theoretical framework which assumes that both individual and environment are stable.

1.2.2   Challenges prompting the research

Challenges prompting the present study can be summarised as follows:

- Although existing instruments aim at supporting career guidance and counselling, there is a need for greater congruence between existing theories, assessment practices and job-specific congruence in the modern-day workplace scenario.
- Existing measures focus on broad career path information and not individual job/role–organisation career path congruence.
- Integrated measures of preferences, career interests and abilities to facilitate individual–organisation career path congruence are limited and are not being adequately addressed in the South African context.
- Limited integrated individual–organisation career path framework applications exist in the South African context to guide congruence between career guidance and counselling practice and real-life workplace scenarios and individual preferences, career interests and abilities (i.e. the absence of guidance and counselling instruments to steer an individual not only towards a career field but also towards role specifics within an identified career field, as well as the absence of clear indicators in terms of how to progress from a particular career point towards another across industries).

1.2.3   Problem statement

The problem statement provides the reader with the general nature of the problem surrounding research on the influence of career anchor preferences, career interests and abilities on career counselling for career path congruence.

The problem statement also provides the background for the following research question:

How can an empirically tested, reliable and valid measure of integrated career anchor preferences, career interests and abilities be constructed that will guide career intervention approaches aimed at improving individual–organisational career path congruence?

The following section states the research questions for the study in terms of the literature review and the empirical study.

1.2.4   Research questions with regard to the literature review

The following are the research questions with regard to the literature review:

Research aim 1: How are the constructs of career anchor preferences, career interests, and abilities conceptualised in the research literature and how do the constructs contribute to the integrated measurement of individual–organisational career path congruence?

Research question 2: What are the implications for organisational career development guidance practices?

1.2.5   Research questions with regard to the empirical study

Research question 1: How can the constructs of career anchor preferences, career interests and abilities be empirically operationalised into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context?

Sub-question 1.1: What are the psychometric properties (reliability and validity) of the integrated career anchor preferences, career interests and abilities congruence scale (i.e. I-PIA-M)?
Sub-question 1.2: What is the nature of the interrelationships between the subscale dimensions of the integrated career anchor preferences, career interests and abilities congruence scale?

Research question 2: Do race, gender and age significantly and positively predict individuals' career anchor preferences, career interests and abilities profile?

Research question 3: Do individuals from various race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities?

Research question 4: How can the empirically validated integrated career anchor preferences, career interests, and abilities measure (i.e. I-PIA-M) be applied in practice to assess individual–organisational career path congruence?

Research question 5: What recommendations can be formulated for organisational career development guidance practices and future research?

1.3 AIMS OF THE RESEARCH

The general aim of the study is to develop an integrated career anchor preference, career interests and abilities measurement scale (i.e. I-PIA-M) in order to guide individual–organisational career path congruence.

1.3.1   Specific aims of the research

The following are the specific aims for the literature review and subsequently the empirical study:

With regard to the *literature review*, the specific aims are as follows:

Research aim 1: To conceptualise the constructs of career anchor preferences, career interests and abilities with a view to generating items for the development of an integrated framework and measure (i.e. I-PIA-M) for individual–organisational career path congruence.

Research aim 2: To critically evaluate the implications of career anchor preferences, career interests and abilities for organisational career development guidance practices.

Regarding the *empirical study*, the specific aims are the following:

Research aim 1: To empirically operationalise the constructs of preferences, career interests and abilities in an integrated empirical measurement scale (i.e. I-PIA-M) to guide individual–organisational career path congruence in the South African organisational context.

Sub-aim 1.1: To determine the psychometric properties (reliability and validity) of the integrated career anchor preferences, career interests and abilities congruence scale of the newly developed I-PIA-M (Integrated career anchor preferences, career interests and abilities measure).

Sub-aim 1.2: To ascertain the nature of the interrelationships between the subscale dimensions of the newly developed I-PIA-M (Integrated career anchor preferences, career interests and abilities measure).

Research aim 2: To assess whether race, age, and gender significantly and positively predict individuals' career anchor preferences, career interests and abilities profile.

Research aim 3: To explore whether individuals from various race, gender and age groups differ significantly regarding their career preferences, career interests and abilities.

Research aim 4: To apply the empirically validated integrated career preferences, career interests and abilities congruence scale (I-PIA-M) in practice to guide individual-organisational career path congruence (qualitative case study).

Research question 5: To formulate recommendations for organisational career development guidance practices and future research.

1.4 STATEMENT OF SIGNIFICANCE

The factors underlying the problem of developing an integrated career anchor preference, career interests and abilities measure (i.e. I-PIA-M) for person–organisation career path congruence appear to be varied and complex. The role played by career-related attributes, such as career anchor preferences, career interests and abilities with regard to organisation-related factors such as organisational career pathways in the development of an integrated career anchor preferences, career interests and abilities measure for person–organisation congruence, is complex and not yet well researched in the South African multicultural organisational context.

The present study focuses on the development of an integrated measure of individuals' career anchor preferences (as postulated by Schein's career anchor theory), career interests (as postulated by Holland's (Holland, 1973, 1997) theory and abilities (as postulated by theories on individual trait differences in relation to career selection [Betz et al., 1989; Snow, 1994]). The research further aims to explore the use of the integrated measure in facilitating person–environment fit (as postulated by Dawis & Lofquist, 1993 and Dawis, 1996; 2005) and career path congruence by exploring and measuring career-related factors (career anchor preferences, career interests and abilities) to guide person–environment fit (as postulated by Holland's (1997) personality and occupational types theory), and in the context of the Dawis and Lofquist's (1993) and Dawis (1996; 2005) theory of TWA/person–environment correspondence.

The study contributes to the field of industrial and organisational psychology, and career psychology and practice on a (1) theoretical, (2) empirical and (3) practical level.

On a *theoretical level*, the present study aims to enhance the understanding of existing career development theories and the influence of career anchor preferences, career interests and abilities and their application to promote integrated career path alignment between individual and organisational career paths within the context of the 21st century world of work.

On an *empirical level*, the research may contribute to developing an empirically tested integrated career anchor preferences, career interests and abilities measure (i.e. I-PIA-M) that may be used in the workplace to promote person–organisation career path congruence. If no relationships are found between the variables, then the usefulness of this study will be restricted to the elimination of career anchor preferences, career interests and abilities as predictors of person–organisation career path congruence. Researchers could then focus their energy on other research studies and avenues that could yield significant evidence for solving the problem of how career-related psychological variables influence person–organisation career path congruence.

On a *practical level*, the research aims to explore the use of the integrated measure (i.e. I-PIA-M) in facilitating person–environment fit (as postulated by Dawis & Lofquist, 1993; Dawis, 1996; 2005) and career path congruence, that is, using career-related aspects relevant to an individual's career anchor preferences, career interests and self-perceived abilities to assess and guide P–E fit. This should enable career practitioners to better align an individual's career anchor preferences, career interests and self-perceived abilities to organisational and occupational career pathways.

Figure 1.1 outlines the significance of the study for the development of an integrated measure of career anchor preferences, career interests and abilities for career path congruence.

Significance of Contribution
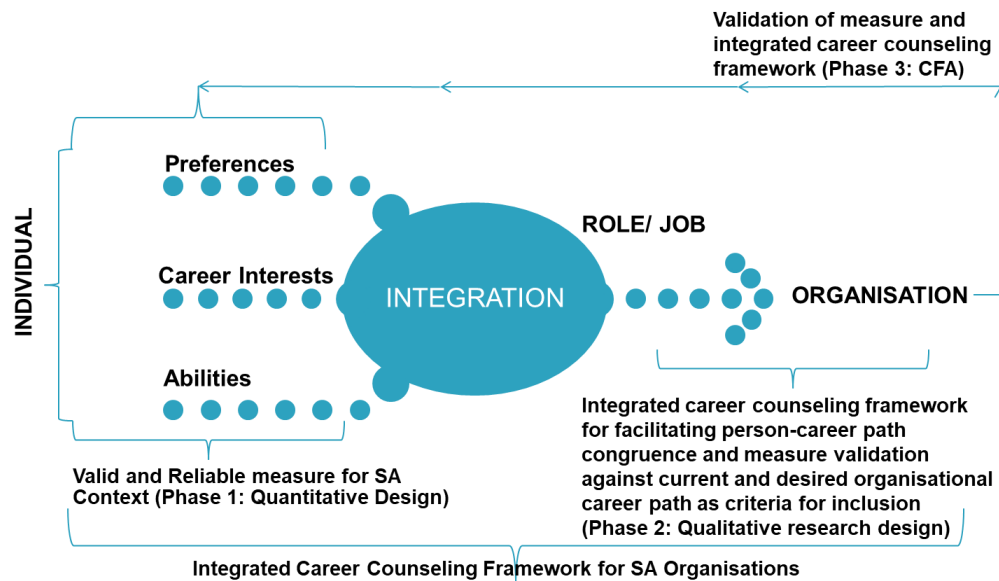
Figure 1.1 Significance of contribution

In line with the statement of significance, Figure 1.2 presents the core research focus for this study. The core focus will be threefold, that is, a focus on the individual (career anchor preferences, career interests and abilities) in terms of person-career path congruence. Apart from individual fit elements, the three foci of P-E fit involve:

- occupational career pathways (as defined by various career models with a focus on educational and world of work perspectives), and
- organisational needs (based on the articulation of occupational career pathways within an organisational context and defined through work and structure considerations to accommodate person–organisation career path congruence).

The outcome of the study will be findings related to the feasibility of the design and application of an integrated measure (i.e. I-PIA-M) to facilitate integrated person-organisation career path congruence in the career counselling context, and as such, to contribute to career management practice within an organisational context.

Figure 1.2. Core research focus

1.5 THE RESEARCH MODEL

The seminal research model of Mouton and Marais (1996) serves as a framework for this research. The model aims to incorporate the five dimensions of social science research, namely:

- sociological (concerned with who does the research and with the context in which the research is conducted),
- ontological (the study is concerned with the reality that is being investigated, which is also referred to as the research domain),
- teleological (whether the purpose or aim of the research is intentional and goal-directed), epistemological (concerned with the nature of knowledge, its possibility, scope, and general basis of the research), and
- methodological (method of research applied, i.e. quantitative, qualitative and/or mixed approach) dimensions, and to systemise them within the framework of the research process.

These five dimensions are all aspects of one and the same process, namely research.

In the context of the present study, social science research models relevant to mixed-method research involving quantitative and qualitative research were considered. Yilmaz (2013), in making a comparison of quantitative and qualitative research traditions, defines quantitative research as research that explains phenomena according to numerical data which are analysed

by means of mathematically based methods, especially statistics, to research a social phenomenon or human problem. In addition, it involves testing a theory consisting of variables which are measured with numbers and analysed with statistics in order to determine whether the theory explains or predicts phenomena of interest (Creswell, 2014; Gay & Airasian, 2000). Qualitative research is defined by Yilmaz (2013) as an emergent, inductive, interpretive and naturalistic approach to the study of people, cases, phenomena, social situations and processes in their natural settings in order to reveal in descriptive terms the meanings that people attach to their experiences of the world. In the present work, quantitative research relates to the development and empirically testing of an integrated career anchor preferences, career interests and abilities measure (i.e. I-PIA-M). Qualitative research relates to a career intervention which involved applying the empirically tested measure in an authentic work setting to guide career path congruence.

1.6 PARADIGM PERSPECTIVES OF THE RESEARCH

According to Mouton and Marais (1996), social science research is a collaborative human activity in which social reality is studied objectively in order to gain a valid understanding of it. The model is described as a systems theoretical model with three interrelated subsystems, which are also interrelated with the research domain of a specific discipline – in this instance, industrial and organisational psychology. The subsystem represents the intellectual climate, the market of intellectual resources and the research process itself.

A paradigm in the social sciences includes the accepted theories, models, body of research and methodologies of a specific perspective (Mouton & Marias, 1996). Their origin is mainly philosophical and is neither testable nor meant to be tested. The present study was conducted in the field of industrial and organisational psychology.

1.6.1   The intellectual climate

The literature review is presented from the perspective of an existential-humanistic and open-systems paradigm and the empirical study from a (1) a postpositivist research paradigm (i.e. quantitative study) and (2) an interpretivist paradigm (i.e. qualitative study).

1.6.1.1 Literature review

The literature review is presented from the existential-humanistic and open-systems perspectives, as outlined below.

a. Existential-humanistic paradigm

Humanistic psychology and the related existential-phenomenological approaches to the study of human behaviour define that fundamental human behaviour in terms of the principle of authenticity (Medlock, 2012; Rogers, 2004). Humans as self-constructing living systems tend to seek to display behaviours that are aligned to their environments (Vondracek et al., 2014). It is therefore important that P–E fit related to career path congruence be explored in order to guide person–organisational career path congruence. A real-life pattern in real time is referred to as a behaviour episode in the context of the living system perspective (Vondracek et al., 2014). Accordingly, individuals tend to be goal directed and to revise their goals from time to time. In addition, efforts to achieve these goals may be postponed various circumstances, and if efforts to achieve these goals fail the goal is discarded (Vondracek et al., 2014).

Existential and humanistic theories share the following common assumptions (Wong, 2005): Firstly, the overarching assumption is that individuals have the freedom and courage to transcend existential givens and biological/environmental influences to create their own future with an emphasis on the phenomenological reality of the experiencing person. Secondly, the focus on the lived experience and future aspirations of the whole person in action and in context, is holistic in nature, and attempts to capture the high drama of human existence – the striving for survival and fulfilment in spite of the human vulnerability to dread and despair. This is supported by Robbins (2008) who states that the humanistic paradigm focuses on the following: humanistic psychology which for the past half-century has focused its attention on what it means to flourish as a human being, and which promotes the self-help movement and encourages self-centredness. These assumptions about humanistic psychology and humanistic psychologists have placed great emphasis on the adaptive and healing qualities of empathy and self-transcendence. According to Medlock (2012), a humanistic approach focuses on promoting the development of human potential. Despite focusing on career path congruence, the emphasis of the current study is on the individual and the alignment of his/her career anchor preferences, career interests and self-perceived abilities to the organisational and/or occupational career pathways in order to promote career satisfaction with due consideration for the environmental context.

b. Systems paradigm

From a career development and management perspective, individuals and environments (organisational perspectives for the purpose of this study) form part of a dynamic and living interactive system. In the context of the living system paradigm (Vondracek et al., 2014), individuals (within the context of their environments) will embark on a process of career goal setting, planning how to achieve the goals, making an effort to realise these goals, being aware of the results achieved, and determining whether to proceed, revise/adjust or discard a course of action that may have an impact on their respective career goals.

A systems paradigm strives to provide a career development framework to support other paradigms such as constructive life design (McMahon, Watson, & Patton, 2015; Patton & McMahon, 2014. In line with this paradigm, the individual represents the core of a circle with a range of personal attributes (including career interests, gender, knowledge, disabilities), encircled with various sources of influence (including family, employment, socioeconomic, political and historical factors) and in the context of past, present and future needs (Patton & MacMahon, 2014). Since its original inception, systems theory has been modified with the placement of the individual rather than the original term *career decision maker* at the centre of the framework, thereby recognising the uniqueness of careers (Patton & McMahon, 2014). In addition, the modified framework also moves attention to the process of dynamic interaction (in particular reference to reciprocal interaction) between the individual and influencing factors (Paton & McMahon, 2014).

Thematically, the empirical study deals with the variables, career anchor preferences, career interests, self-perceived abilities and organisational career pathing in the context of P–E fit, with a focus on how best individuals fit organisational and occupational career pathways, and as such systems theory is relevant to the current study. It is important to note that the systems theory framework (STF) is not designed to be a theory of career development, but rather a framework that forms a basis on which all concepts of career development can be usefully positioned and can be utilised in theory and practice with the individual as central focus, thus constructing his/her meaning of career and representing a useful theoretical foundation for practice (Patton & McMahon, 2015).

1.6.1.2 The empirical research: quantitative research

The empirical research will consider the paradigm of postpositivism. According to Grey (2014), the contemporary postpositivist world requires a number of research perspectives to be considered, namely, anti-positivist, postpositivist and naturalistic. As cited in Grey (2014), Onwuegbuzie, Johnson, and Collins (2009) make clear that today's practising quantitative researchers would regard themselves as postpositivists, holding that there is an independent reality to be studied but that all observation is inherently fallible and, as such, researchers can only approximate the truth, never explaining it perfectly or completely. Hence, given the fallibility of observations, postpositivist research lays emphasis on inferential statistics with their emphasis on assigning probabilities (and not certainties) that observed findings are correct (Grey, 2014).

Postpositivism addresses the following issues: (1) the quality of the (input) data; (2) the use of a more integrated approach; and (3) the context of the studied phenomenon (Adam, 2014). According to Adam (2014), positivism somehow presupposes that data are good quality and adequate if they can be quantified and thus bypasses the problem of context by dealing with the multitude of variables and correlations between them. The interpretation of findings is therefore relatively categorical and very little attention is paid to controversial findings (Adam, 2014). The essence of the postpositivist paradigm is precise because it problematises certain taken-for-granted aspects in the research on innovation processes and their impact on society, while also trying to provide solutions and make suggestions for a more appropriate measurement of these processes, as well as new possibilities of interpretation (Adam, 2014).

1.6.1.3 The empirical research: qualitative research

An interpretivist paradigm was applied which expedited an in-depth understanding and interpretation of the themes and congruence meanings revealed during my interaction as researcher with the respondents. According to Thanha and Thanha (2015), it is theoretically understood that an interpretivist paradigm allows researchers to view the world through the perceptions and experiences of the participants and uses those experiences to construct and interpret his/her understanding from the gathered data. In discussing the characteristics of qualitative research as well as interpretive enquiry, Creswell (2007) explains that researchers use their own interpretations, and those of their participants, to explain the results of the data collected. In following a mixed-method approach to research, the researcher will typically apply a quantitative approach (for description, comparing groups and relating variables by using

numerical data) and a qualitative approach (for coding, theme development and relating themes using text and image data) (Creswell, 2013).

1.6.2 Metatheoretical statements

Metatheoretical statements represent a vital category of assumptions underlying the theories, model and paradigms of this research. In a disciplinary context, this study focuses on industrial and organisational psychology as a field of application (Mouton & Marais, 1996). Metatheoretical statements are presented on the following:

1.6.2.1 Industrial and organisational psychology

According to Van Vuuren (2010), the mandate of industrial psychology has traditionally been the matching of workforce to workplace by explaining and influencing human behaviour in organisations. The role of industrial and organisational (I-O) psychologists is to assist and support employees and they often have to act as counsellors (Barkhuizen, Jorgensen, & Brink, 2014). According to the Health Professions Council of South Africa, a qualified I-O psychologist should be able to apply knowledge, theories and techniques of psychology to develop and implement interventions to enhance and/or promote individual, group or organisational well-being and optimal functioning (Barkhuizen et al., 2014). Applied industrial and organisational psychology uses the psychological principles and the new knowledge and solutions generated by research to solve problems in the work context (Bergh, 2009; Coetzee & Schreuder, 2010). The industrial psychologist is a scientist-practitioner, implying that industrial psychology accumulates, orders and disseminates knowledge through research, using rigorous scientific methodology (Van Vuuren, 2010). According to Van Vuuren (2010), the epistemology of scientific knowledge in the discipline is to understand, predict and change or influence workplace-related human behaviour. The 'practitioner' component relates to how industrial psychologists apply this knowledge in the workplace to identify and solve specific problems and, in the process, often create new knowledge through interaction, reflection and evaluation (Van Vuuren, 2010).

The study falls within the domain of industrial and organisational psychology by examining the relationship between the individual's career anchor preferences, career interests and abilities, as well as the dynamics between these concepts and P–E fit in terms of person–organisation career path congruence in the work environment.

The relevant subfields of industrial and organisational psychology included in this research are career psychology, organisational psychology and psychometrics.

1.6.2.2 Career psychology

Career psychology comprises the study field of career development and career behaviour as an integral part of human development.

Career psychology is concerned with the interaction between the individual and the workplace and tends to describe the patterns of positions held and the resultant experiences during an individual's lifespan (Sharma, 2016). Career psychology as a discipline focuses on providing models and explanations for organisational career-related activities such as the origin and measurement of individual aptitudes, personality, interests and career orientations, motives and values. It also examines the way individual, social, chance and environmental factors shape educational and training experiences, employee employability, career embeddedness and mobility, experiences of career well-being, job and career satisfaction, career agency, early work history, occupational choice, organisational/job choice and career movements after organisational entry, work/family issues, career plateaus and retirement planning (Sharma, 2016). According to Greenhaus et al. (2010), career development refers to an ongoing process whereby an individual progress through a series of stages, each of which is characterised by a relatively unique set of issues, themes or tasks. Career development involves the process of developing beliefs, values, attitudes, skills, personality and knowledge pertaining to the world of work (Sharma, 2016).

This study has relevance in the field of career psychology because it supports the need for an overall conceptual framework of career development and career choices in the contemporary world of work. Thematically, the notions of career anchor preferences, career interests and abilities, and P–E fit as a composite set of person-environment fit variables are of relevance to this research.

1.6.2.3 Psychometrics

According Cohen, Swerdlik, and Sturman (2013), psychometrics can be defined as the science of psychological measurement and involves both the domains of psychological assessment and psychological testing. The focus of psychological assessment is the gathering of psychological data on an individual for the purposes of reaching a conclusion based on scientific evaluation using tools such as tests, interviews, case studies, behavioural observation, and specially designed apparatuses and measurement procedures (Cohen et al., 2013).

Psychometrics is highly relevant and central to the development and evaluation of psychological tests and measures. In addition, it is an area of increasing importance in reproductive psychology specifically and behavioural sciences more generally (Martin & Savage-McGlynn, 2013). According to Martin and Savage-McGlynn (2013), psychometrics describes the statistical approach to the development and evaluation of psychological tests, including personality and intelligence and, importantly, includes those tests which are used in clinical research and practice. According to Miller, Lovler, and McIntire (2013), psychometrics include intelligence tests, personality tests, interest and vocational inventories, achievement tests, ability tests, structured interviews and assessment centres. For the purposes of this study, the focus will be on interests and vocational inventories, and ability tests.

Central to this process are the established approaches to the key areas of statistical testing used in psychology, including validity and reliability. Tests of validity and reliability relate broadly to the development and evaluation of psychometric measures and the determination of the usefulness and robustness of such tools. An appreciation of the individual testing procedures that are utilised and how these are also used in combination in order to be fit for purpose for the specific aspects of a particular psychometric evaluation is critical in terms of the design, analysis and reporting of psychometric results (Martin & Savage-McGlynn, 2013).

In the design of psychometric instruments, item construction forms a critical element of the instrument's validity and reliability. A primary goal of scale development is to create a valid measure of an underlying construct (Clark & Watson, 1995). According to Clark and Watson (1995), it is critical to write 'good' items, since phrasing of items can have a profound influence on the construct that is measured.

In this study, questionnaires were used to measure individuals' career anchor preferences, career interests and abilities, and the dynamic relationship between these concepts to guide individual–organisational career path congruence. In addition, the psychometric properties of the newly developed Integrated Career Anchor Preferences, Career Interests and Abilities (I-PIA-M) instrument were assessed.

1.6.3   Conceptual descriptions

The conceptual descriptions (based on theoretical models) that are described here are testable statements about the 'what' (prescriptive) and 'why' (interpretative) of human behaviour and social phenomena. These include all statements that form part of hypotheses, typologies, models, theories and conceptual descriptions (Mouton & Marais, 1996).

The following conceptual descriptions serve as points of departure for discussion in this research:

   a.   *Career anchor preferences*

In the context of this study, career anchor preferences are defined in the context of Schein's (1990; 2006) theory of career anchors as a combination of important (most preferred) drivers or orientations that explain the perceived areas of competence, and the motives and values an individual will consider in reaching a career choice decision about person-vocation fit. Career anchor preferences are measured by means of Schein's (1996; 2006) Career Orientations Inventory as a sub-component of the I-PIA-M.

   b.   *Career interests*

For the purposes of this research, *career interests* are defined in terms of Holland's (1997) theory of personality and vocational types, focusing most explicitly on interests (Hansen, 2013; Nauta, 2013). Holland (1997) uses a primary survey, the Self-Directed Search (Holland, 1972; 1994) to distinguish between six personality types and six matching work environments, with each type characterised by preferences for and aversions to particular activities (Schreuder & Coetzee, 2011). This classification, labelled RIASEC, represents six theoretical personality types with identifiable dominant career interests, namely Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The RIASEC personality types are mapped back to occupational categories to determine person-vocation fit in the career path congruence context (Gottfredson & Holland, 1996) as well as to represent work environments that the individual will consider as career alternatives. In constructing the I-PIA-M, various existing standardised instruments were consulted, including the Campbell Interest and Skills Survey (CISS) (Campbell, 2002), and the Self-Directed Search (SDS) (Holland, 1972). However, the items for the measurement of interests were self-constructed by using the RIASEC framework as point of reference. In the qualitative study, the Interest Determination, Exploration and Assessment System (IDEAS) (Johansson, 2007) questionnaire is also applied to the case study to classify clients' (respondents') career

interests in terms of the RIASEC codes and to compare the client's preferred RIASEC code with their I-PIA-M results as an aspct of further validation.

c. Abilities

Abilities, aptitudes and skills are separate yet highly related constructs (Metz & Jones, 2013). According to Snow (1994), ability is the physical or mental capacity (learnt or innate) to complete a specific act or task. In the context of the current study, the focus was on self-perceived abilities in relation to career interests and career anchor preferences as measured by the I-PIA-M. The principles of TWA theory/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis,1996; 2005) are applied in exploring the role of abilities in terms of person-job fit in the career path congruence context.

d. Person–environment fit

P–E fit refers to the level of congruence or correspondence between an individual's expectation of an environment and the environment's corresponding needs or demands (Dawis & Lofquist, 1993). The Minnesota Theory of Work Adjustment (TWA)/P-E correspondence (Dawis & Lofquist, 1993; Dawis, 1996; 2005) is considered a model of P–E fit, as is Holland's (1997) personality and occupational types theory (Swanson & Schneider, 2013). Vocational choice is maximised by specifying important characteristics of the individual and the environment in order to find the best match between individual and environment (Swanson & Schneider, 2013). PE-Fit relates to three theories of fit: (1) person-occupation fit (Holland, 1997; Schein, 1996) which relates to constructs of career interests and career anchor preferences; (2) person-job fit (TWA/P-E correspondence, Dawis & Lofquist, 1993; Dawis, 1996; 2005) which relates to construct of abilities; and (3) person-organisation fit (WWM: Prediger, 2002; Holland's (1997) RIASEC occupational categories.

e. Career construction interview

In the context of individual career path congruence, the career construction interview developed by Savickas (2012), was applied to the case study respondents who participated in the qualitative study. The qualitative study aimed to identify and confirm career life themes that best align with the respondents' career path indicators identified during the application of the empirical tested I-PIA-M.

f. Individual career path congruence

In the context of P–E fit, individual and organisational career path congruence forms a core construct of this study. During this study, the results of the I-PIA-M (career anchor preferences career interests, abilities) were compared and related to the career model frameworks (models based on educational or academic principles; models based on established research models such as Holland's (1997) RIASEC framework, and those based on occupational or job clustering perspectives applied during this research. The aim was to provide greater insight into the alignment of an individual's career theme profile and the contemporary career pathways within organisational context.

In summary, the various constructs, the theory/model and the measure to be applied are listed in Table 1.1.

Table 1.1

Constructs, Theories/Models, and Measure of Career Anchor Preferences, Career Interests and Abilities

Construct	Theory/model	Measure
Career anchor preference this will be tested as an integrated aspect of the new I-PIA-M scale.	Career anchor theory (Schein, 1990,1996, 2006)	Career anchor preferences were measured using the items of Schein's career orientations inventory (Schein, 1990, 2006) as a subscale of the newly designed Integrated Career Preferences, Career Interests and Abilities Measure (I-PIA-M).
Career interests	Holland's personality and occupational types theory denoted by RIASEC (Holland, 1997)	Career interests were measured using self-developed items contained in the newly designed I-PIA-M. The IDEAS questionnaire was added to the case study under the qualitative study to verify the RIASEC score identified by the I-PIA-M

Abilities	TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005)	Self-perceived abilities were measured using self-developed items contained in the newly designed I-PIA-M to investigate whether there is correspondence between a person's abilities and the demands-abilities of the career area/job type
Career life themes	Career Construction Interview (Savickas, 2012)	During the qualitative study the career construction interview was applied to participants to explore career life themes. The themes were compared and integrated with the outcomes of the I-PIA-M to confirm and/or enrich the understanding of person-organisation career path congruence.

1.6.4 Central hypothesis

The central hypothesis of the research can be formulated as follows:

Generally, it is hypothesised that individuals' career anchor preferences, career interests and abilities can be measured in an integrated manner with a reliable and valid measure that can be applied in career counselling and guidance for person–career path congruence.

1.7 RESEARCH DESIGN

According to Creswell (2014), research approaches are the plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis and interpretation. These include the procedures of inquiry (called research design) and specific research methods (Creswell, 2014), as outlined in Figure 1.3.

Elements of inquiry

Alternative knowledge claims

Approaches to research

Qualitative

Strategies of inquiry   Quantitative

Mixed methods

Conceptualised
by the researcher

Methods

Translated into
practice

**Design process
of research**

Questions
Theoretical lens
Data collection
Data analysis
Write up
Validation
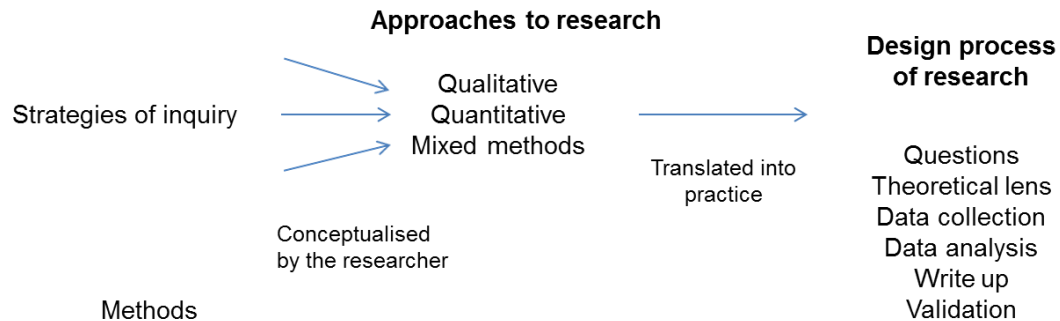
Figure 1.3. Knowledge claims, strategies of inquiry, and methods leading to approaches and the design process (Creswell, 2014, p. 5)

The above illustration, which is based on Crotty's (1998) research model, as depicted by Creswell (2003, p. 5), places emphasis on the following questions:

- What knowledge claims are being made by the researcher (including the theoretical perspective)?
- What strategies of inquiry will inform the research procedures?
- What methods of data collection and analysis will be used?

Research designs are used by researchers to answer research questions. Research design represents the plan related to the collecting, measuring, analysing and reporting of data with the aim of rendering the research purposes relevant (Gray, 2014; Terre Blanche, Durrheim, & Painter, 2006).

The design and methods utilised in this research are now discussed.

The research design must be congruent with the tenets of the research paradigm chosen and therefore likely to produce the desired results. For the purposes of this research, the literature review is presented from the perspective of a humanistic-existential and an open-systems

paradigm and the empirical study from a (1) a postpositivist research paradigm (i.e. quantitative study) and (2) an interpretivist paradigm (i.e. qualitative study).

The purpose of the research design relevant to the current research is to solve the research problem by developing a strategy for operationalising the career anchor preferences, career interests and abilities constructs into a valid and reliable measurement scale (i.e. I-PIA-M) that can serve as an integrated framework for person–career path congruence in career guidance and counselling practices. This will be achieved by developing a strategy for obtaining empirical (quantitative and qualitative) data that will answer the general research question and the research hypothesis posited.

The research design followed in the current research represents the conceptual structure within which the research was conducted and was important to provide for the collection of relevant information with minimal expenditure of effort, time and money. Consequently, the researcher took the following aspects into consideration when deciding on the appropriateness of the design:

- the research problem under investigation
- the purpose of the research
- the methods of data collection adopted
- the population and sample for the research
- the data collection instrument, and
- the data analysis techniques.

1.7.1 Types of research relevant to the current study

Research is defined as "a systematic process of collecting, analysing and interpreting information (data) in order to increase understanding of the phenomena about which researchers are interested or concerned" (Leedy & Ormrod, 2005, p. 2). According to Gray (2014), the purpose of applied research is to improve the understanding of specific social or organisational problems, to create solutions to these problems, and to develop findings of practical relevance to public and organisational stakeholders. Consequently, the following types of research are discussed with reference to their relevance in the current research, namely, exploratory, descriptive, and explanatory.

1.7.1.1 Exploratory research

Exploratory research is appropriate when a researcher wants to gain insight into relatively unknown areas of research and to investigate causal explanations of phenomena (Grey, 2014; Terre Blanche et al., 2006). This research therefore investigated the level of congruence between individual career anchor preferences, career interests and abilities for the purpose of developing an integrated measure for person–career path congruence. The study is limited due to its cross-sectional and exploratory nature, which means that the results should be seen as a basis for future research. The focus is on exploring a range of research literature on career constructs with a view to empirically these constructs into a measure and, subsequently, empirically testing the psychometric properties (internal consistency, reliability and construct validity) of the newly developed integrated measure of career anchor preferences, career interests and abilities, and applying the measure in an authentic career intervention context.

1.7.1.2 Descriptive research

A descriptive strategy of enquiry will also be used as part of the research design for this study. This strategy provided the researcher with an opportunity to look with intense accuracy at the phenomenon under investigation. The type of research is aimed at investigating the full nature of the phenomenon, the way it is manifested and the other factors to which it is related. Descriptive research, however, presents a picture of the specific details of a situation, social setting or relationship by focusing on how and why questions (Mouton, 2001, p. 54) and to generate a profile of the characteristics of the sample through statistical analysis, charts and graphs to describe and report on research data (Rowley, 2014). According to Terre Blanch et al. (2006), descriptive research aims to describe phenomena accurately, either through narrative-type descriptions (e.g. interviews), classification (e.g. different types of risks people face) or measuring relationships between various elements that impact on the phenomena. Descriptive research entails the gathering and analysis of responses in terms of independent, mediating, or dependent variables (Creswell, 2014 and thus descriptive statistics are applied to measure these relationships and refer to methods that summarise and investigate the essence of sets of information so it can be understood more readily and from different vantage points (Abbott & Mckinney, 2013).

In the literature review, descriptive research applies to the conceptualisation of the constructs career anchor preferences, career interests and abilities in the context of person–career path congruence.

In the empirical study, descriptive research applies to the elements of the theoretical framework for the constructs career anchor preferences, career interests and abilities operationalised in a valid and reliable integrated measure and assessment of the psychometric properties (internal consistency, reliability and construct validity) of the developed measure, namely the I-PIA-M scale. In the context of this study, the measure will focus on items relevant to career anchor preferences, career interests and self-perceived abilities, and the application of the measure in the career guidance context.

Descriptive statistics will be reported in Chapter 5 (Research results: quantitative study) and Chapter 6 (Results: qualitative study) to present the profile of the sample used in the current research.

The research followed an applied research goal which was aimed at developing valid and reliable an integrated career anchor preferences, career interests and abilities measure for career path congruence guidance.

1.7.1.3 *Explanatory research*

According to Mouton and Marais (1996) and Grey (2014), explanatory research aims to indicate causality between variables or events. It attempts to clarify why and how there is a relationship between two or more aspects of a situation or phenomenon. This type of research is used in cases where the researcher goes beyond showing the difference and where any correlations between variables exist. An attempt will be made in this research to determine the relationship between the various subscale dimensions of the I-PIA-M scale and whether biographical characteristics of the sample (age, gender) significantly predict the subscale dimensions. The direction of the relationship will be discussed with reference to the research subgroups such as race and age. However, due to the cross-sectional nature of the research, no cause-effect relations could be established.

1.7.2 Research approach

The current research followed a mixed-method approach. Firstly, a cross-sectional quantitative research design was followed in developing and administering the new scale (I-PIA-M). Secondly, a qualitative research design involving a career construction interview with a selected participant pool, as well as a case study approach pertaining to the administering of the empirically tested I-PIA-M in practice were included.

The qualitative study followed an explorative, descriptive, case study approach (McMillan & Schumacher, 2009) to facilitate an in-depth investigation of the congruence between respondents' career anchor preferences, career interests and abilities and their current and desired career pathways in the relevant organisation. A qualitative approach enabled the collection of evidence from multiple perspectives within a particular organisational context (Creswell, 2013) to better understand the phenomenon of individual–organisational career path congruence.

1.8 RESEARCH METHOD

The research was conducted in three phases, with each of these phases consisting of several steps. Figure 1.4 below provides an overview of the different phases.

1.8.1 Phase 1: Literature review

Literature was reviewed following the steps below

1.8.1.1 Step 1: Meta-theoretical context – contemporary organisational career development

This step consisted of a review of the literature relevant to the changing nature of careers, a review of the major theories within the career development and career management domain and an investigation of existing and evolving research frameworks based on these theories. Career path modelling within an organisational context was explored in chapter 2.

1.8.1.2 Step 2: Career anchor preferences, career interests and abilities in the context of person–environment congruence

This step represents a literature review of theories pertaining to career anchor preferences, career interests and abilities, and investigating the influence of the person–environment fit on these

concepts. The impact of various theories such as trait-factor, personality and occupational types according to environment correspondence was investigated. In the context of P–E fit, the impact of contemporary career and industry frameworks was explored in chapter 2.

1.8.1.3 Step 3: Theoretical integration

This step relates to the theoretical integration of the constructs of ability, career interests, career anchors and career path alignment through an integrated career guidance and counselling framework. A critical evaluation is presented to explain the predictive power of these variables on individual–organisational career path alignment with the probable additional value of predicted career success. The research culminates in conceptualising an integrative framework of career guidance as manifested in the literature. The implications of the conceptualised framework for career management practices are provided in chapter 7.

The literature review process flow diagram is depicted as phase 1 in Figure 1.4.
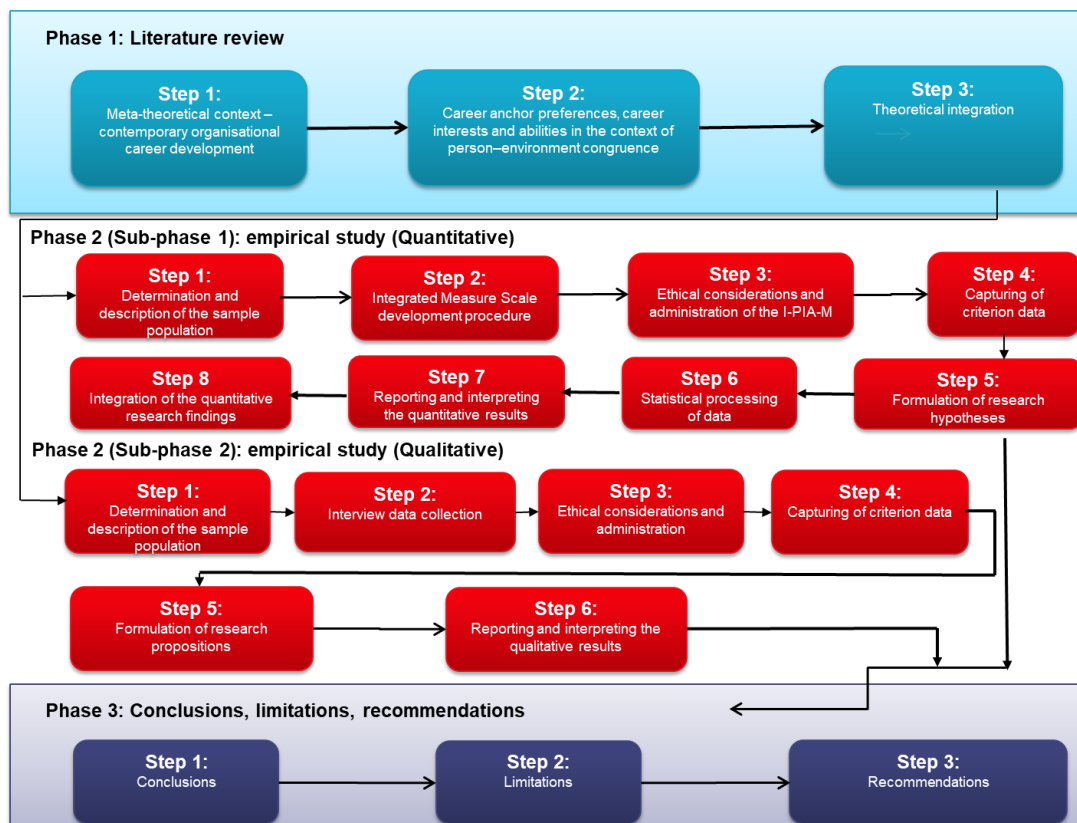
Figure 1.4. Flow diagram of the research method.

1.8.2 Phase 2: The empirical study

Figure 1.4 summarises the empirical research aims, with the quantitative study depicted as phase 2 and the qualitative study depicted as phase 3, together with the research hypotheses, propositions, and quantitative (statistical) and qualitative procedures used to achieve the research aims. These aspects are discussed in detail in Chapter 4.

The research comprised a mixed-method (quantitative and qualitative) research design. As shown in figure 1.4, the research consisted of the following subphases, each with its own steps:

1.8.2.1 Subphase I: Quantitative study

The quantitative study involved the following steps:

Step 1: Determination and description of the sample population

The determination and description of the population and sample are discussed in detail in Chapter 4.

Step 2: Integrated Measure Scale development procedure

The scale development of the I-PIA-M questionnaire was conducted in line with existing scale development protocols. The scale development procedure relevant to the I-PIA-M is discussed in Chapter 4.

Step 3: Ethical considerations and administration of the I-PIA-M

The I-PIA-M was administered to the respondent target group (discussed in Chapter 4) and also requested biographical information from respondents such as age, gender and race. Ethical considerations and the method of data collection are explained in Chapter 4.

Step 4: Capturing of criterion data

The capturing of the data and the data analysis conducted during this step are summarised in Chapter 4.

Step 5: Formulation of research hypotheses

This step involved the formulation of the hypotheses to be used to realise the research objectives and is discussed in Chapter 4.

Step 6: Statistical processing of data

The relevant statistical procedures used during this step are explained in detail in Chapter 5.

Step 7: Reporting and interpreting the quantitative results

This step involved the presentation of the research results and is described in Chapter 5.

Step 8: Integration of the quantitative research findings

The results of the empirical research relevant to the quantitative research were integrated into the findings of the literature review in Chapter 5.

1.8.2.2 Subphase 2: Qualitative study

The qualitative study involved the following steps:

Step 1: Determination and description of the sample population

The determination and description of the population and sample are discussed in detail in Chapter 4.

Step 2: Interview data collection

The method for interview data collection is discussed in detail in Chapter 4. The interviews were conducted by the researcher in English and in a predetermined setting within the workplace environment.

Step 3: Ethical considerations and administration

The career construction interview (Savickas, 2012) and the I-PIA-M were administered to the respondent target group (respondent group discussed in Chapter 4) and also requested

biographical information from the respondents such as age, gender and race. Ethical considerations and the method of qualitative data collection are explained in Chapter 4.

Step 4: Capturing of criterion data

The capturing of the qualitative data and the data/career theme analysis conducted during this step are summarised in Chapter 4.

Step 5: Formulation of research propositions

This step involved the formulation of the propositions to be used to realise the research objectives and is discussed in Chapter 4.

Step 6: Reporting and interpreting the qualitative results

This step involved the presentation of the research results and is described in Chapter 6.

1.8.3 Phase 3: Discussion and formulation of conclusions, limitations, and recommendations

The presentation of the results and their discussion, together with the integration of research findings of the quantitative and qualitative research, have led to conclusions. The final step therefore pertained to drawing conclusions from the findings, culminating in integration with theory. The limitations and recommendations for future research are discussed in Chapter 7.

1.9 DESCRIPTION OF THE RESEARCH VARIABLES

According to Mouton and Marais (1996), explanatory research aims to indicate causality between variables or events. It attempts to clarify why and how there is a relationship between two or more aspects of a situation or phenomenon. Typically, explanatory research involves a two-phase approach in which the researcher collects quantitative data in the first phase, analyses the results, and then uses the results to plan (or build on to) the second, qualitative phase, for example the researcher collects quantitative data through a survey method, and based on the results, selects the representative sample for qualitative interviews (Creswell, 2014). This type of research is used in cases where the researcher goes beyond showing the difference and where any correlations between variables exist. In the context of this research, the independent variables are the behavioural elements (career anchor preferences, career interests, and abilities) and the

constructs that constitute these elements. The overall construct, career path congruence, was treated as the dependent variable. The two stages of the development scale are depicted in Figure 1.5. The subgroup variables of age, gender and race are the independent variables and the I-PIA-M construct elements are the dependent variables.

Stage One

Independent variables:
Behavioural elements (career anchor preferences, career interests & abilities)

Dependent variable:
Career path congruence (as postulated by TWA and influenced by organisational career path articulation)

Stage Two

Independent variables:
Race, age and gender

Dependent variable:
I-PIA-M construct elements
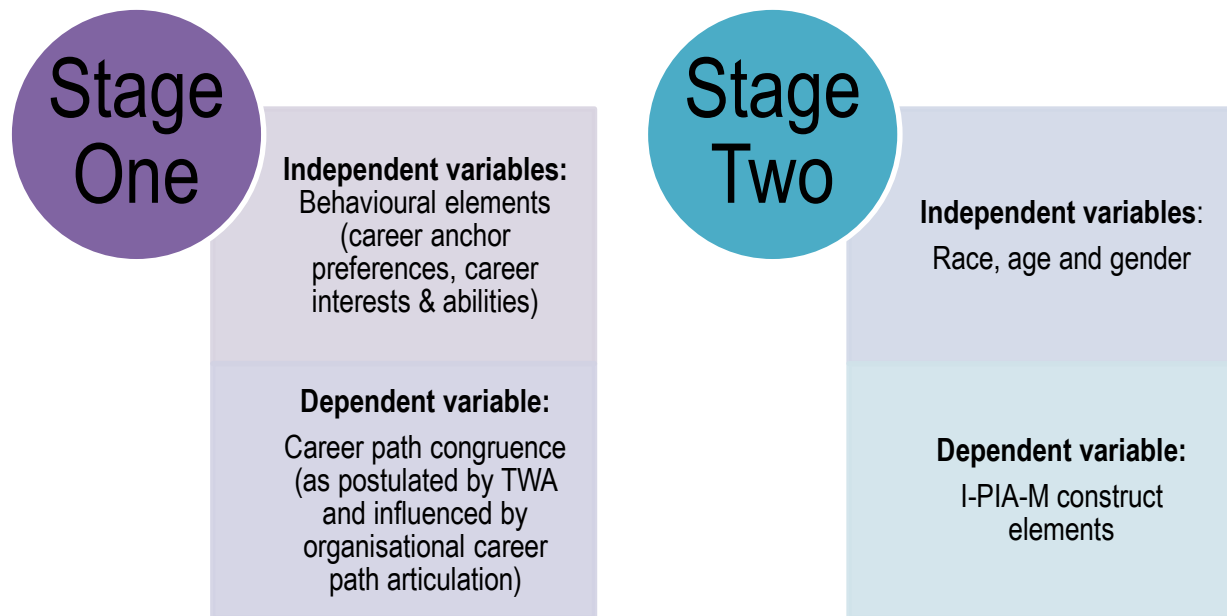
Figure 1.5. Two stages in the development of the I-PIA-M scale

1.10 VALIDITY AND RELIABILITY

The researcher must make a concerted effort to ensure that the research process enhances the validity and reliability of the research findings. The subsections below describe how validity and reliability will be ensured in this research.

1.10.1 Validity

According to Abbott, and McKinney (2013), validity is the extent to which a research measure actually captures the meaning of the concept it is intended to measure. According to Mouton and Marais (1996), the aim of the research design is to plan and structure the research project in such a way that the validity of the literature review and empirical investigation is ensured in terms of the research variables.

Validity in this research will be in terms of construct and face validity, as well as discriminant and convergent validity. *Construct validity* defines how well a test or experiment measures up to its claims. It refers to whether the operational definition of a variable actually reflects the true theoretical meaning of a concept (Saraiva, Rodrigues, Cordovil, & Barreiros, 2013). *Discriminant validity* is a property that scales are expected to show. Accordingly, a scale showing this property has been proven not to correlate with scales representing constructs that are regarded as unrelated to the construct that is represented by this scale (Ogara, Koh, & Prybutok, 2014). Discrimination is an important characteristic of an innovation in personality assessment, since a dimension of personality is hypothesised. *Convergent validity* is a type of validity that is determined by hypothesising and examining the overlap between two or more tests that presumably measure the same construct (Lysaght, 2015). Convergent validity is used to evaluate the degree to which two or more measures that should theoretically be related to each other are, in fact, observed to be related to each other (Luedtke & Van der Laan, 2016). *Face validity* simply means the validity at face value and, in the case of this research, involved qualitative correlation of research data against theoretical constructs. Validity in the context of this study will be discussed in more detail

The subsections below describe how validity and reliability were ensured in this research.

1.10.1.1Validity with regard to the literature review

Validity in the literature review was ensured as follows:

- All reference material was acknowledged.
- A central research question which was aligned to the purpose of the research was formulated.
- Existing and relevant theories and models were used to guide both the theoretical and empirical phases of the research.
- Conceptual descriptions of all relevant concepts and constructs used in the research were provided as they are seen theoretically and were used empirically.
- A comprehensive literature search of the library and on the internet was conducted, using search engines and databases.
- The most recent and relevant literature sources were used, although classical and contemporary mainstream research resources were referred to where relevant to the conceptualisation of the constructs of the research.

- The literature review was aligned to the research topic, the research problem and the research aims.

1.10.1.2Validity with regard to the empirical research

Validity in the empirical study was ensured as follows:

- Established scale development protocols were followed in developing the new measure.
- The research measure was subjected to a process of expert review before using it for data collection.
- Inputs from the expert review process were used to refine the measure.
- The psychometric properties of the new measure were evaluated in terms of construct validity and the researcher was guided by existing scientific parameters.
- The constructs of the research were measured in a valid manner.
- Efforts were made to ensure that the data collected were accurate and were accurately coded and appropriately analysed to ensure content validity.
- To ensure content validity, the researcher made sure that the findings of this research were based on the data analysed.
- The researcher ensured that the final conclusions, implications and recommendations were based on the findings of the research.

1.10.2 Reliability

Reliability is the extent to which a research measure provides a consistent evaluation of a concept (Abbott & McKinney, 2013, p. 81) and refers to the stability of the findings (Gray, 2014).

EFA and CFA were conducted to assess the factorial and structural validity and reliability of the newly developed scale, as well as the internal consistency reliability and the construct validity of the three subscales of the I-PIA-M as discussed in chapters 4 and 5.

1.10.2 1 Unit of research

The unit of research stipulates the entity that is the focus of the study (De Vos et al., 2016). This study focused on the variables of career anchor preferences, career interests, abilities and career path congruence. The study analysed the individual results of each of the measuring tools and

methods applied (both the I-PIA-M, and the career construction interview in the case of the qualitative research), as well as the overall results of the demographic variables (age, gender, race). The objective of the study was to analyse the relationship dynamics between the constructs of career anchor preferences, career interests, abilities (self-perceived abilities) and career path congruence in order to develop an integrated career anchor preferences, career interests and abilities measure for career path congruence.

1.11 QUALITATIVE STUDY: STRATEGIES EMPLOYED TO ENSURE QUALITY DATA

The strategies employed to ensure quality data included the following:

- Qualitative research relies on the transferability of the findings and not generalisation to the bigger population (Stergiou, Airey, & Riley, 2008). A rich description of the context of the study was provided to enhance contextual applicability.
- Confirmability limits researcher bias by connecting the results of the study with raw data. In other words, confirmability traces the findings to the raw data, thus ensuring that the results are not merely based on the researcher's own assumptions, biases or worldview (Clissett, 2008; Petty, Thomson, & Stew, 2012).
- Dependability was assured by using an inquiry audit and having an external auditor examine the research process. In an audit trail and a research journal were kept (Petty et al., 2012).
- The integrity of the data was ensured using various safeguards. All the data transcripts were kept safely on the researcher's computer and data mass storage devices, which were password protected. In so doing, the confidentiality of the information was maintained (Petty et al., 2012; Stergiou et al., 2010).

1.12 DELIMITATIONS

The nature of this research dictated that some limitations of scope had to be set. The research approach was intended to gather relevant data that would answer the research questions and achieve the research aims set for this research. The research data were gathered exclusively within South Africa, which limits the generalisability of the findings to other countries. The research was undertaken in the person–work environment (career congruence) context. The paradigmatic perspective of the research limited the interpretation of the findings to the definitive boundary of industrial and organisational psychology and career psychology. The development of the I-PIA-M

was limited to the isolation of the range of career constructs of relevance to this research career anchor preference (preferred orientation towards work); career interests (vocational interests and their relationship to career decision-making, integration of higher-order abilities, interests), abilities (self-perceived competence that had been acquired through practice and repeated use). and considering other factors in relation to career path congruence. The subgroup variables are further limited to age, gender and race.

1.13 ETHICAL CONSIDERATIONS

To ensure that the researcher met the ethical requirements, the following ethical principles emphasised in Unisa's Policy on Research Ethics were adhered to (Unisa, 2016):

- The essentiality and relevance of the research were clearly outlined.
- Information on the research undertaken was made available to all parties concerned.
- Experts in the field of research were consulted to ensure a scientific research process.
- The dignity and privacy of the research participants were protected.
- Confidentiality and anonymity of data were ensured.
- Informed and noncoerced consent was obtained from all participants.
- Cultural differences were respected.
- Scientific and fair criteria were used for the selection of research participants.
- The research was conducted in an honest, fair and transparent manner.
- Potential risks, if any, were identified in advance and communicated to all parties involved. Precautions were taken to minimise the adverse effects of such risks.
- Participants remained anonymous and no personal information was obtained or published.
- An opportunity for obtaining information about the research was created by reporting the research process and findings in the form of a thesis.

1.14 CHAPTER DIVISION

This section provides a conceptual outline of the chapters of this research:

Chapter 2 – Meta-theoretical Context: Contemporary Organisational Career Development

This chapter discusses the theory pertaining to the changing nature of careers and reviews the major theories pertaining to the career development and career management domain. Challenges facing career path modelling within an organisational context will also be explored. The chapter concludes with a summary.

Chapter 3:   Career anchor preference, Career Interests and Abilities within the Context of Person–environment Congruence

The chapter seeks to provide insight into concepts identified as part of chapter 2 that have a direct impact on career satisfaction and person–environment-fit. In the context of this study, the focus will be on the impact of career interests and self-perceived abilities on an integrated perspective of person–organisation career path congruence, and the influence of career anchor preferences to support the notion of person–career path congruence. To create context in terms of the role of career anchor preferences, career interests and self-perceived abilities in the context of person–career path congruence, these concepts and the relevant theoretical models will be discussed. The chapter concludes with a summary.

Chapter 4: Research Method

This chapter describes the research methodology applied in conducting the study. An outline of the research approach is provided, followed by a description of the research participants, as well as the research procedure followed in developing and administering the new scale. The statistical procedures applied in testing the psychometric properties of the new I-PIA-M scale are also discussed. In addition, the procedure for applying the tested I-PIA-M in practice (qualitative study) is outlined. The chapter concludes with a summary.

Chapter 5: Research Results: Quantitative Study

In this chapter, the results of the descriptive, explanatory and inferential statistical analyses conducted in the quantitative study are reported.

Chapter 6: Research Results: Qualitative Study

This chapter reports on the results of the descriptive, explanatory and inferential statistical analyses conducted in the qualitative study.

Chapter 7: Discussion, Conclusions, Limitations and Recommendations

In this, the final chapter, the results are integrated, discussed and interpreted and the conclusions drawn are reported. The limitations of the study are explained, and recommendations are made pertaining to the fields of industrial and organisational psychology and employment relations, both as applied in practice and in terms of further research. The chapter ends with a synthesis of the quantitative and qualitative research findings and concluding remarks on the integration of the research.

1.15 CHAPTER SUMMARY

This chapter presented the background to and motivation for this research. The research problem and questions were outlined, followed by a discussion of the research aims and contextual/theoretical guiding frameworks. The problem statement was formulated, supported by the research questions and the aims relevant to the theoretical and empirical study, including the statement of significance.

The research model and paradigm perspectives of the research were also discussed, followed by an outline of the central hypothesis to guide the research. An outline of the research design was provided supported by a discussion of the framework for the research method pertaining to the mixed approach applied in this research (quantitative and qualitative). In terms of the research method, the chapter also provided a description of the research variables, and the way in which reliability and validity would be managed. Owing to the inclusion of a qualitative research component, an outline was provided to guide the strategies for ensuring the quality of the qualitative data.

A summary of the expected limitations and ethical considerations pertaining to the research was also provided, followed by a summary of the chapter division.

CHAPTER 2

META-THEORETICAL CONTEXT: CONTEMPORARY ORGANISATIONAL CAREER DEVELOPMENT

This chapter discusses the theory pertaining to the changing nature of careers and reviews the major theories within the career development and career management domain. Challenges facing career path modelling within an organisational context will also be explored.

Core themes to be discussed in this chapter are summarised as follows:

| NATURE OF CAREERS IN THE CHANGING WORLD OF WORK | The changing nature of careers:
 • Traditional versus contemporary perspectives
 • Multidirectional career paths
 • Factors influencing career choice decision making (Employability; knowledge economy; Human social capital)

 Major theories impacting on person-career path congruence:
 • Trait and factor/person-environment fit theories
 • Person-in-environment perspectives
 • System theory
 • Life span developmental theory
 • Career construction and life design |

⟷

| • Status of career path congruence
 • Challenges facing career path modelling within organisations
 • Business case studies related to career path modelling

 Career path modelling and guiding frameworks:
 • Models based on educational or academic principles
 • Models based on established research models such as Holland's (1997) RIASEC model
 • Models based on occupational or job clustering perspectives | CAREER PATHING IN ORGANISATIONAL CONTEXT |

Evaluation and synthesis

Figure 2.1. Overview of chapter core themes.

2.1 ORGANISATIONAL CAREER DEVELOPMENT IN THE 21ST CENTURY WORLD OF WORK

In this section, the changing nature of careers and the subsequent impact on employability, the knowledge economy and human social capital as factors affecting the design of a career life will be discussed. In addition, the focus will fall on the influence of traditional versus contemporary careers.

2.1.1 The changing nature of careers: multidirectional career paths

Much research has been recorded on the changing world of work. Sampson and Reardon (2011, p. 41) reviewed career literature highlighting the vast changes that have affected the world of work. The world of work has transitioned through various ages, starting with the industrial age, which is still evident in the impact of technology not only on the work environment but on life in general. As technology, globalisation and automation have reshaped the workplace, occupations have changed fundamentally, with occupations becoming fluid and organisations evolving rapidly, adapting their workforce to respond to a rapidly evolving marketplace (Lent 2018). As such, there is a need to review stances on ways to approach the occupational challenges in order to reflect the demands of the contemporary work environment. Barley and Bechky (2017) highlighted the following factors as impacting the contemporary world of work:

- the demise of manufacturing and other relatively well-paying middle-class jobs associated with the bureaucratic employment contract in which employees exchanged labour and loyalty for security
- the growth of contingent work, a general term for forms of employment tied to the completion of a specific task and, hence, of relatively short duration, leading in many instances to the trend towards project-based forms of organising spreading across employing organisations
- The effects that artificial intelligence (robots, intelligent devices, and applications of statistical learning theory) will have on the nature of work and the availability of employment opportunities.

In addition, the following factors need to be considered when exploring new ways of dealing with the changing world of work in the modern or contemporary work environment. These factors have played out in different way across different contexts and for different role players such as employers and employees (Hooley & Borbely-Pecze, 2017):

- Political shifts – in an environment where policy makers seem to apply a neoliberal consensus, some shifts such as the Brexit vote in the UK could influence career development opportunities
- Shifts in global political and economic power leading to the emergence of new economic centres such as BRIC countries (Brazil, Russia, India and China) plus the USA
- Continued population growth leads to, among others, a youth bulge and, coupled with seemingly rising longevity and an increase in international mobility and migration can have a

direct impact on career development opportunities. This is further complicated by a rise towards urbanisation and thus the shift towards the majority of the world's population living in cities

- An Increased recognition of the interaction between the environment and the economy, for example, continuing rises in carbon emissions which is associated with both economic growth and climate change could impact on worker lives.

The question is how organisations and individuals deal with the above challenges from a career development and management perspective. Traditionally, a career comprised a one-directional pathway, and often individuals remaining with one employer over a career life span. In the postmodern era, traditional views of careers, where one's career was defined by a steady progression up the corporate ladder, no longer apply. Various changes in the work environment such as dynamic changes in the labour market have an impact on the contemporary career (Korsakiene & Smaliukiene, 2014), and the move towards multiple careers (Korsakiene & Smaliukiene, 2014), with a greater emphasis on self-directed vocational behaviour (De Vos & Soens, 2008; Korsakiene & Smaliukiene, 2014). This has led to the emergence of protean and boundaryless career patterns among individuals (Korsakiene & Smaliukiene, 2014), which are regarded as the most influential concepts related to the contemporary career (Lochab & Mor, 2013). Unlike the traditional career which was conceived of and could unfold in a single organisational setting, the boundaryless career is a multifaceted phenomenon that can involve and transcend various boundaries both physically and psychologically (Arthur & Rousseau, 1996; Briscoe & Hall, 2006). In a boundaryless world, individuals can move across organisations and occupations to pursue the best opportunities for their personal and professional development without the negative stigma of failing in an organisational career (Baruch & Vardi, 2016).

According to Baruch and Vardi (2016), career progression comes not only from intra-company hierarchical advancement but also, and even more often, from self-development. The emphasis is placed on physical mobility across boundaries. According to Enache, Sallan, Simo, and Fernandez (2011), these experiences are not strictly limited to inter- and intra-organisational mobility but encompass careers that are, firstly, sustained by external networks that provide access to the resources other people possess and therefore offer opportunities for the individuals to develop new skills and competences and to enhance their marketability and future employability; secondly, careers that prioritise life interests over objective career opportunities

and, thirdly, that are based on a subjective interpretation of the individual who decides that a boundaryless career is more rewarding than a traditional one.

The primary dimensions of the protean career (similar to those of the boundaryless career) are the fact that it is proactively self-directed and flexible, meaning that individuals are responsible for managing their own careers and taking the initiative in exploring career options and making career decisions. In addition, the protean career is value-driven; hence, individuals make career decisions to meet their personally meaningful values and goals, resulting in feelings of psychological and subjective wellbeing (De Vos & Soens, 2008; Greenhaus et al., 2010; Hermman, Hirschi, & Baruch, 2015; Nishanthi, 2016).

For the individual to adapt successfully to the changing world of work and adjust to the contemporary world of work characterised by the protean and boundaryless career patterns, adaptability is important. Adaptability consists of the attitudes, behaviours and competencies or skills that individuals use to make the adjustments needed in their work environment to facilitate their career changes. Well-developed adaptability enhances the developmental processes needed to implement the self-concept in work. Individual professional skills are a deciding factor for individuals to perform adequately in their jobs, and professional competence is often a key factor in individual promotion and applying competencies in various situations (Liu & Chen, 2013). Adaptability refers to the ability of an individual to prepare for future career tasks (concern), take responsibility for their own career development (control), explore possible future selves and career opportunities (curiosity), and believe in their ability to succeed in solving career-related problems (confidence) (Savickas, 2013; Savickas & Porfeli, 2012). Thus, career adaptability refers to an individual's readiness to cope with changing work and working conditions (Coetzee & Roythorne-Jacobs, 2012). Savickas (2005) conceptualises adaptive individuals as those who become concerned about their future as a worker and then act to increase their personal control over their vocational future. Adaptive individuals are proactive, displaying curiosity and exploring possible selves and future scenarios. They also seek to strengthen their self-confidence (or self-efficacy) to pursue their aspirations (Schreuder & Coetzee, 2011). Hall (2002) describes adaptability as a higher-order quality of metacompetency that allows for the mastery of additional skills. Individuals who have obtained a high level of career maturity may be more ready and open to strengthening their career adaptability (Coetzee & Roythorne-Jacobs, 2012).

Differences between traditional views of careers and contemporary 21st century perspectives are summarised in Table 2.1 (Coetzee & Roythorne-Jacobs, 2012, p. 5). From a traditional

54

perspective, careers focused on vertical progression and individuals to remain in the employ of a single organisation throughout the duration of their career life span. This implies that organisations took responsibility for career management. However, owing to changes in the world of work resulting from new demands (such as technology and the global economy) the emphasis has shifted to employability for sustainable career management, flexibility and the individual taking greater responsibility for their own career growth. Organisations today require more dynamic and flexible career management approaches as a result of the dynamic and ever-changing demands on organisations to adjust to market and global demands. Globalisation demands that individuals are able to work across various organisations and countries on a global level, and by implication for multiple organisations. The impact of global career trends, such as the boundaryless and protean career paths, also requires individuals to be able to follow multidirectional career paths. Individuals and organisations need to consider all these factors when addressing career development and management elements in the context of person–organisation career path congruence.

Table 2.1

Traditional Views of Careers and Contemporary 21st Century Perspectives

CAREERS IN THE TRADITIONAL WORKPLACE	CAREERS IN THE 21st CENTURY WORKPLACE
Vertical movement	Lateral movements
Career success externally motivated	Career success internally motivated
Emphasis on becoming secure and sense of belonging	Emphasis on becoming free (autonomy)
Employees expect company to predict their career paths upwards	Career paths are a mutual discussion on own growth strategies and lateral moving
Career success linked to more rewards	Career success linked with more competencies and growth
Expected lifelong employment	Employees can no more expect lifelong employment as they may experience seven to eight career changes through the life span
Security lies in positions, organisations and being employed	Security lies in person and being employable through portable skills and reputation (internally defined)
Career advancement measured in positions and levels attained	Career advancement measured in terms of career renewal which takes place in tasks and skills mastered
Employees relied on organisation for career development	Career development based on self-reliance and career self-management
Entire career could be sustained by one employer through the life span	More inter-organisational movements beyond single employers; intra-organisational mobility which features frequent job rotation, developmental assignments and transitions
Career identity fully internalised company values and goals (employment is context based: 'I am an IBM engineer')	Career identity develops around a person's skills and competencies (Employment is employer independent: 'I am a software engineer')
Psychological contract is relational (exchange of both monetary and non-monetary benefits; mutual loyalty, support, career rewards)	Psychological contract is shifting from relational to transactional, where employer contracts for application of specific skills and compensates skill holder (competency trader) for satisfactory performance and expertise

Source: Coetzee and Roythorne-Jacobs (2012, p. 5)

From an organisational perspective, a paradigm shift is required to manage individuals' careers in the contemporary work environment. As Baruch (2006) states, in the past organisations had a rigid hierarchical structure and operated within a stable environment while careers were predictable, secure and linear. In contrast, the contemporary environment reflects change, is dynamic and fluid and, subsequently, careers are more unpredictable, vulnerable and multidirectional (Baruch, 2006). Research by Ginevra et al. (2018) related to the role of adaptability and future orientation in career interests emphasises the importance of promoting a broader range of vocational interests among individuals based on the premise that having a broader spectrum of interests can be useful in exploring multiple occupations and in planning a broader range of career goals. The results underscore the importance of promoting career adaptability and future orientation to foster a broader range of vocational interests among individuals and, thus, providing more opportunity to respond to the demands of the current job market (Ginevra et al., 2018). In promoting person–organisation career path congruence, organisations should be enabled to align career pathways more closely to employees' profiles based on individuals' broader career goals.

P–E congruence is closely related to the notion of career path alignment/congruence within the organisational context. Career paths are typically the career options available to an individual within an organisation or occupational field and provide potential pathways that prospective and existing employees can consider over their career life span (Billeh, 2016; Ginevra et al., 2018). In the context of this study, career pathing refers to the alignment between an individual's career anchor preferences, career interests and abilities and the career path frameworks available in the working environment. These frameworks typically manifest in job structure, job and competency profiling and are informed through educational and industry career path frameworks. Factors influencing the need for an organisation to embrace career paths include inability to find, recruit and place the right people in the right job, employee disengagement, employee demands for greater workforce flexibility, a multigenerational workforce, limited opportunity for advancement and organisational culture change (Billeh, 2016).

In investigating the theoretical relationship between an individual's career anchor preferences, career interests and abilities and the way these constructs relate to organisational career path frameworks, an understanding of the notion of person–environment (P–E) fit is important. All P–E fit theories share the following assumptions (Su et al., 2015): People seek out and create environments that allow them to manifest their traits behaviourally (e.g. dominant individuals seek leadership positions); and the extent to which people fit their work environments has significant

consequences (e.g. satisfaction, performance, stress, productivity, turnover), with better fit associated with better outcomes. An individual has a set of needs and values that may (or may not) be met by rewards available in the work environment; and secondly, the work environment has a set of job requirements that may (or may not) be met by the skills and abilities that the individual possesses. If an individual's needs are met by the work environment, then the person and the environment are in correspondence (determining satisfaction or dissatisfaction), likewise if the requirements of the work environment are met. If not in either or both instances, then the individual and the environment are in discorrespondence (determining satisfactoriness or unsatisfactoriness) (Swanson & Schneider, 2013). According to Swanson and Schneider (2013), satisfaction refers to an individual's satisfaction with his or her job, while satisfactoriness refers to an individual with whom the work environment is satisfied, Should an individual be both satisfied and satisfactory, then the individual and his or her work environment are in a state of harmonious equilibrium (Swanson & Schneider, 2013).

From an organisational perspective, it is therefore important to understand the concept of career path modelling to promote alignment between individual and organisational career path perceptions. Career path modelling refers to efforts by organisations to develop career pathways based on educational, industry and organisation-specific career path frameworks. Career maps are used to show what a prototypical career looks like in terms of sequential positions, roles and stages (Cao & Thomas, 2013). Cao and Thomas (2013) outline common avenues for moving within and across jobs in ways that facilitate growth and career advancement. Career maps are typically displayed in a diagram, making it easy to visualise each position or role as a stage in a path. Career mapping should benefit practices aimed at assisting individuals to identify positions within the organisation that best meet their career anchor preferences, career interests and abilities.

Traditionally, career paths were conceptualised as one-dimensional, using a vertical career ladder. However, the contemporary notion of career path increases the number of career options, with career paths being less stringent and more variable with an emphasis on horizontal and diagonal career paths (Klupáková, 2013). Individuals need to consider various career options resulting in multidirectional career paths. According to Baruch (2004), multidirectional career modelling considers the full scale of landscapes, in terms of which individuals can choose the next destination, decide to opt for alternatives avenues to reach the destination and gain various experiences along the way. Thus, the individual navigates his or her own career, creating new paths when the time feels right, and choosing the direction to pursue in order to realise personal

development goals (Baruch, 2004). Multidirectionality does not stop at the actual career path undertaken but rather implies a re-evaluation of career success in light of the multi-options criteria for assessing success in careers (Baruch & Vardi, 2016). From an organisational perspective, the contemporary environment indicates a practice that moves away from fixed job profiles to ones that are more broadly defined, requiring a greater range of knowledge and skills. This implies a greater need for training and development, as well as the continual redesign of positions, often leading to the linking of previously specialised positions, which is accompanied by demands for employee 'versatility' (Klupáková, 2013).

In summary, the world of work is changing owing to the impact of technology and changes in the psychological contract, with individuals taking greater ownership of their careers and the organisation providing support for career development. At the same time, the organisation needs to understand its own environment, and how best to align career paths in the organisation to individual career anchor preferences, career interests and abilities. Alignment of an individual's career anchor preferences, career interests and abilities with organisational career pathways should enhance mutual career satisfaction. If this occurs then the individual and their work environment are in a state of harmonious equilibrium (Swanson & Schneider, 2013), thus enabling talent retention and job satisfaction. All of these concepts will be discussed in this and the next chapter. The aim is to shed light on the factors that have an impact on person–career path congruence, both from an individual and an organisational perspective. In this context, the impact of boundaryless, protean career patterns with be discussed, as well as factors influencing the changes that have occurred regarding career perspectives. Such factors include the impact of employability, the knowledge economy and human social capital factors.

2.1.2   Impact of employability on careers

Employability refers to an individual's ability to align their knowledge, skills and experience to the requirements of employment opportunities (Schreuder & Coetzee, 2011, p. 36). It therefore refers to an individual's perception of their ability to identify and realise job and career opportunities (Fugate, Kinicki, & Ashforth, 2004). Typically, the individual's perceptions are reflected in statements about having options, having the capacity to change jobs, and confidence about future hiring, which influences career perspectives (Culie, Khapova, & Arthur, 2014). Perceived employability is a result of a broad package of competencies, including occupational expertise, anticipation and optimisation of the work environment, and personal flexibility (Van der Heijde & Van der Heijden, 2006).

Adaptability and future orientation in managing one's own broader range of career interests to adjust to the changing world of work requires individuals to focus on their own career adaptability in terms of the alignment of own skills and levels of resilience, as well as taking ownership of emotions, behaviours and attitudes essential for career satisfaction and success to remain employable within the changing world, local economies and job markets (Ginevra et al., 2018; Hartung & Cadaret, 2017). To enable employability, the alignment of an individual's career anchor preferences, career interests and abilities with organisational career pathways should enhance mutual career satisfaction, leading to the individual and their work environment being in a state of harmonious equilibrium (Swanson & Schneider, 2013).

Perceived employability is also influenced by career anchor preferences (Schein, 1990). A study conducted by Urbanavičiūtė, Bagdžiūnienė, Lazauskaitė-Zabielskė, Van der Elst, and De Witte (2015) investigated the determinants of quantitative and qualitative job insecurity. Although financial and social strain were proven to influence job insecurity, an additional influencing factor was found to be perceived employability (Urbanavičiūtė et al., 2015). Perceived employability reflects the way a person evaluates himself as a member of the labour market and how they perceive their chances of controlling their own employment situation (Urbanavičiūtė et al., 2015).

Challenges for individuals in this regard will be to promote their own employability relevant to contemporary world of work needs, and organisations may experience challenges in ensuring that the alignment of organisational needs and individuals' integrated career anchor preferences, career interests and abilities profile variances promote effective talent management and talent retention strategies.

In summary, employability infers that the individual needs to ensure that he or she remains relevant in terms of competency and skills to be employable with due consideration of the changing workplace. The individual needs to ensure that own competency offerings do not become obsolete in the sense that skills sets are no longer aligned to the needs of the workplace. Similarly, organisations need to ensure that employees get the opportunity to remain abreast of changes in competency requirements. For the purposes of this study it is important to investigate the level of congruence between individuals' career anchor preferences, career interests and abilities and the career path alternatives available in the workplace, and the extent to which individuals' career anchor preferences, career interests and abilities can predict career options to enhance employability.

2.1.3 Impact of the knowledge economy on careers

Over the past few decades, the concept of a knowledge economy has become increasingly important as a source of economic growth and competitiveness across all economic sectors (Hadad, 2017). This requires the rapid development of skills, solid knowledge and greater responsibility. The knowledge-based economy is defined by representatives of the Organization for Economic Cooperation and Development (OECD, 1996, p. 7) as economic environments characterised by production, distribution of products and/or sources, and the use of knowledge and information to realise strategic goals and objectives. According to Hadad (2017), contemporary society has evolved into a learning society and, as such, people are required to contribute to their own development of competencies to contribute effectively to their respective societies. Modern-day organisations require new knowledge and skills to respond effectively to industry and market demands, resulting in the employment of more specialists and knowledge workers (Hadad, 2017).

In the changing world of work, organisations are consistently obliged to align job and career requirements. Industry and market demands may require a review of occupational requirements and will oblige organisations to be more effective in matching an individual's profile to the job requirements based on a combination of qualities and skills. Moreover, individuals/workers need guidance towards in terms of the jobs for which they are most capable of undertaking (Arulmani, Bakshi, Leong, & Watts, 2014). Over and above the alignment of job and career requirements to deal with industrial and market demands, career path modelling (the alignment of organisational career paths in the context of people capability or job family requirements) also supports career management initiatives to drive talent development and retention strategies. This is as a result of the knowledge economy and a more complex and differentiated organisation (Schreuder & Coetzee, 2016). Employees are seen to be employable if they have up-to-date technical knowledge about their working domain, demonstrate openness and resilience towards contextual and workplace changes (Froehlich, Beausaert, Segers, & Gerken, 2014) and are able to demonstrate a range of transferable generic capacities (Rocha, 2012).

In summary, to assure employability the individual needs to ensure that he or she remains relevant in terms of the competencies and skills required in the contemporary workplace. In today's workplace, knowledge of markets and industries is core to organisational success in offering products or services relevant to the market. Organisations are also challenged to adapt to changes and be more agile in gaining market share and remaining competitive. This requires the

ability to know the market and to innovate through, for example, technology (digital applications). Industry and market demands may require a review of occupational requirements and will require organisations to be more effective in matching an individual's profile to job requirements, based on a combination of qualities and skills. Moreover, individuals/workers need guidance regarding the jobs he or she is most capable of. In today's world, various channels of engagement exist, and it is far easier to reach the market. At the same time, there is a greater need to make information available to inform the market, and people have greater access to a variety of information which facilitates decision-making. It is therefore critical that this study investigate the impact of the knowledge economy on person–career path congruence. From an organisational perspective, organisations need to ensure that job competency requirements remain aligned to the context of the knowledge economy to promote profitability and sustainability, while individuals need to ensure interests and abilities (including knowledge) are aligned to the latest trends and knowledge demands to promote employability.

2.1.4 Impact of human social capital on careers

Human capital refers to the individuals working in the organisation and contributing to organisational capability through adequate people capabilities. In an organisation, social capital refers to the features of a social organisation such as the information, trust and norms of reciprocity inherent in one's social networks that may facilitate coordinated actions (Ucol-Ganiron Jr & Malvecino-Ganiron, 2012). Social capital represents the following factors regarding career life design (Ucol-Ganiron Jr & Malvecino-Ganiron, 2012):

- Both network structure and quality of relationships are thought to be important in achieving various outcomes.
- Being engaged in networking itself might lead to perceiving one's career as successful because of active engagement in improving one's level of knowledge and expertise, as well as one's self-perceived increase in commitment to career.
- Networks and professional linkages play a vital role in improving the technical skills of one's profession.
- Role models and mentors have been found to be the greatest positive social influence.
- Social trust can be viewed as a product that is nurtured through social relationships.
- The amount of social capital possessed is determined by whether individuals can occupy an advantageous network where they get tied to others who possess desirable resources, such

as information and financial support, in order to achieve positive work-related and career outcomes.

- Social capital is also positively related to promotions and career satisfaction.
- The lack of social capital and access to resources and information may result in a decrease in upward mobility, career satisfaction and increase in staff turnover.

A study conducted by Savari, Eslami, and Monavarifard (2013) investigated the impact of social capital on agricultural employees' job satisfaction in the city of Divandare (Kurdistan). The results showed that the components of social capital (relational, cognitive and structural) have a positive and significant relationship with employees' job satisfaction. That is, if the employees of an organisation interact often and potentially have trust in each other they generally have higher social capital. Accordingly, not only will their job satisfaction increase but organisational performance will also improve (Savari et al., 2013). The value of social capital in relation to career success is supported by trends such as networking and the influence of social ties in career decision-making (Akkermans & Kubasch, 2017), with research indicating that strong networks and social ties have predictor value as moderators and mediators of career mobility and success (Akkermans & Kubasch, 2017). One such example is the impact of social media, which allows organisations and individuals to explore the alignment of an individual's profile with organisational requirements. For example, organisations seek to advertise jobs and/or careers through social media channels, and individuals can use social media to share their attributes and competencies with potential employers.

In summary, social networks are an important factor in person–career path congruence, representing trust in the information provided by others such as family and friends on career matters. Interpersonal engagement and social capital have a positive and significant impact on job satisfaction owing to the importance of social approval in career aspirations. In investigating what makes work meaningful, Baily and Madden (2016), in describing the five qualities of meaningful work, concluded that receiving praise, recognition or acknowledgment from others mattered a great deal. According to Baily and Madden (2016), individuals tend to experience their work as meaningful when it matters to others rather than just to themselves. In addition, meaningfulness is based on the role their careers play in the wider context of their personal life experiences. One example cited by Baily and Madden (2016) is that of a musician who described his profound sense of meaningfulness when his father attended a performance of his for the first time and finally came to appreciate and understand the musician's work. In investigating social

capital and career success in civil engineers with respect to designing career paths, Ganiron Jr (2013) concluded that the most objectively successful civil engineer appears to be one who has technical and employability skills learnt from mentor, network and professional linkages. From the perspective of an individual who aspires to be a successful civil engineer, it appears that high social capital pays off (Ganiron Jr, 2013).

In conclusion, for the purposes of this study, the following insights are gained in terms of the changing world of work and that factors that influence career development and management in the contemporary work environment:

- The emphasis has shifted from organisations (employer) managing careers to the individual taking accountability for their own career, with the organisation (employer) facilitating the process when the individual is in the employ of the organisation.
- Traditionally, individuals remained within the employ of a single employer (organisation) over an entire life span, with the focus on vertical progression. The contemporary career pattern cuts across various (multiple) organisations (even on a global level) and can result in multidirectional career paths for individuals.
- Factors that influence careers need to be understood in order to promote alignment between an individual's career anchor preferences, career interests and abilities profile and organisational requirements. These factors include employability, the impact of the knowledge economy and the impact of human social capital on careers. Individuals have to ensure that they remain relevant in terms of the competencies and skills required to remain employable. Accordingly, due consideration should be given to the changing workplace, with input gained from social networks in relation to potential career choices representing an important factor in person–career path congruence.

2.2 REVIEW OF MAJOR THEORIES INFLUENCING PERSON–CAREER PATH CONGRUENCE

This section will focus on the various theories that have an impact on person–organisation career path congruence.

2.2.1 Conceptualisation

Career path congruence refers to the level of fit between an individual's career anchor preferences, self-perceived career interests and abilities, and career path alignment within the contemporary work environment. According to Filmer (2015), career management challenges faced by organisations include the nature of the information organisations require on their employees' career aspirations; what organisations believe individuals want from them; and where tensions lie between the organisation and individual needs. Mercer's (2015) career frameworks survey lists career pathing and competency development as the most important reasons for implementing career path alignment frameworks in organisations (Filmer, 2015).

Using the principles of P–E fit or congruence postulated by the trait-and-factor theories, the current research focuses on the notion of career path congruence which is seen as the match (or fit/congruence) between an individual's preferences, interests and abilities (person characteristics) and the career pathway of a job within a particular organisation (environmental characteristics). In the context of P–E correspondence theory (Dawis & Lofquist, 1993; 1996), P–E fit and career path congruence, that is, using career-related aspects to assess and predict such fit (as postulated by Holland's [1997] personality and occupational types theory), is important for promoting talent retention and providing individuals with an opportunity to plan and grow their careers. As stated under section 2.1.1, organisations apply career path modelling to define the sequence of positions and jobs to promote person-organisation career path congruence.

2.2.2   Theories

In the context of this study, this section will provide a critical view of the following theories in terms of their impact on person–career path congruence:

- Trait-and-factor/P–E fit theories
- Person-in-environment perspectives
- System theory
- Life span developmental theory
- Career construction and life design.

2.2.2.1 Trait-and-factor/person–environment fit theories

Trait-and-factor/P–E fit theories play an important role in terms of career anchor preferences, career interests and abilities in the context of person–organisation career path congruence. The trait-and-factor theory is proposed as a refined career theory that also incorporates the idea of reciprocity between P and E characteristics (Wille et al., 2012). As a trait-and-factor theory (Schreuder & Coetzee, 2016), Holland's (1997) theory seems to give an explanation of the interaction between individuals and their occupational environments and the way in which the dynamic interplay contributes to perceptions of P-E congruence or fit. Holland (1997) describes P-E congruence as the compatibility between an individual's personality type and the characteristics of the occupational environment within which the career is pursued. Similarly, Dawis and Lofquist's (1993) and Dawis (1996) theory of P–E correspondence posits that an individual's career development process is the unfolding of the individual's abilities and requirements in interaction with the individual's various life-career role environments (i.e. home, school, play and work). Person and environment attempt to achieve and maintain correspondence with each other – optimal correspondence or congruence achieved through this dynamic reciprocity generally leads to career success and satisfaction (Dawis, 1996; Schreuder & Coetzee, 2016).

For the purposes of this study, this section will include a critical discussion of the following theories:

- Parsons' trait-and-factor theory
- Holland's theory of personality and occupational types
- Dawis and Lofquist's theory of work adjustment and P–E correspondence

a. Parsons trait-and-factor theory

Parsons (1909) developed a three-pronged approach to assist individuals to make wise career decisions and become successfully employed (Schreuder & Coetzee, 2016). The approach assists people to develop a clear understanding of themselves, that is, their aptitudes, interests, abilities, skills, attitudes, values, personality, ambitions, achievements and resource limitations, job or occupation-related knowledge, and logical or reasoned matching of individual traits to the job that best 'fits' them (Sharf, 2010; Shoffner, 2006).

Although the trait-factor theory has not received much attention in the literature over the past few decades, the fact is that most school and vocational counsellors practise the trait-factor theory approach in one way or another. In fact, many of the aptitude, personality and interest tests and occupational information materials have evolved steadily from Parsons' work and remain in use today (James & Gilliland, 2003).

In terms of the trait-factor approach, the nature and requirements of the occupation determine which individual characteristics are measured, which can include working with numbers and working with technical equipment (Schreuder & Coetzee, 2011). According to Schreuder and Coetzee (2011), those characteristics (traits and factors) that are measured for vocational guidance purposes are mental abilities, personal characteristics, interests and, to a lesser extent, values.

The trait-factor approach is concerned with the total development of an individual across their life stages and environments (James & Gilliland, 2003) and infers that everyone possesses a unique and stable pattern of traits that can be measured and that successful performance on critical occupational tasks requires a unique trait set that relates back to an occupation. The higher the congruence between individual traits and occupational requirements, the more likely it is that the individual will perform the tasks involved successfully and should also lead to greater personal satisfaction. Atli (2016), in investigating the effects of trait-factor-based career counselling on the levels of career maturity and indecision of high school students, concluded that to be able to make a correct and accurate decision during the career selection phase, the individual must be aware of the skills, interests and values they possess. In addition, professional assistance should be obtained regarding the use of these traits. The findings show that the application of trait-factor-based career counselling significantly increased the career maturity scores of high school students (Atli, 2016).

The trait-and-factor approach is the general approach used in all of the career theories (e.g. Holland's (1997) personality and occupational types theory and Dawis and Lofquist's (1984) theory of work adjustment/person–environment correspondence). Nevertheless, it holds certain disadvantages, which are summarised as follows (Schreuder & Coetzee, 2016):

- Trait-and-factor theory comes across as a deceptively simple theory. However, the approach is limited because it is a mechanistic approach in which the machine serves as a metaphor for human beings, with humans being seen as passive rather than actively functioning beings

and psychological phenomena are reduced to mere quantitative variables in the form of measurable traits.

- The theory does not provide a guide to which tests or inventories the counsellor should include in his or her repertoire.

- The theory is also regarded as a static rather than a developmental theory – by focusing only on identifying traits and factors, the theory ignores the way achievements, aptitudes, values and personalities grow and change over time.

- Insufficient attention is paid to the fact that individuals, as well as jobs, can change – both have growth potential – thus career choice cannot be likened to a prediction of a final fit between the individual and the job at a given point in time. Research has shown that prediction of success in specific occupations is not reliable if it is based solely on the measurement of traits because tests do not supply sufficient information on the individual.

In summary, many aptitude, interest and personality assessment instruments use the trait approach. In terms of the trait approach, congruence between occupational requirements and individual characteristics is important for career and job success. Trait examples include working with numbers and technical ability. Vocational guidance is used to measure characteristics (traits and factors) in terms of mental abilities, personal characteristics and interests and, to a lesser extent, values. Successful performance on critical occupational tasks requires a unique trait set and relates back to the occupation. The higher the congruence between individual traits or characteristics and occupational requirements, the more likely the individual will be to perform the tasks and the greater the personal satisfaction. Although the trait approach may be seen as mechanistic, it is used in theories such as Holland's (1997) personality and occupational types theory and Dawis and Lofquist (1984) theory of work adjustment and correspondence to explain the impact of congruence between personal characteristics and occupational requirements, and thus, on person–career path congruence.

b. Holland's (1997) theory of personality and occupational types

Holland's (1997) personality and occupational types theory is generally recognised as one of the most important and influential in the field of career development and vocational psychology (Foutch, McHugh, Bertoch, & Reardon, 2014).

The main ideas of Holland's (1997) theory can be summarised as follows (Gottfredson & Johnstun, 2009; Greenhaus et al., 2010):

- *Environments.* Vocational and other environments may be characterised in terms of their resemblance to six model environments, with the actual environments people experience resembling the ideal environments to different degrees, and an environment may be described in terms of the environmental models it most resembles.
- *Persons.* Individuals may be characterised in terms of their resemblance to six personality types, with each type displaying distinctive competencies, preferences, values and self-evaluations. Both the six personalities and the six ideal environments are described in terms of Holland's RIASEC framework.
- *Person–environment (P–E) interaction.* A person tends to display the characteristics and pursue the values of the personality type he or she most resembles, with the interaction of personality dispositions and environmental demands and rewards resulting in degrees of congruence or incongruence between person and environment.

Holland's theory classifies individuals, jobs and environments into six personality types (Carless, 1999; Dik, Strife, & Hansen, 2010; Gottfredson & Holland, 1996; Gottfredson & Johnstun, 2009):

- *Realistic.* Activities involving the manipulation of mechanical devices and the principles of mechanics and physics. High scorers are likely to be technically orientated, repairing mechanical devices and working on motor cars. They may also enjoy outdoor activities.
- *Investigative.* Activities involving the manipulation of ideas and scientific principles. High scorers will enjoy applying logical and/or scientific principles to the resolution of experimental problems. They may also enjoy laboratory work.
- *Artistic.* Activities centred on the expression of artistic and creative ideas. High scorers are typically interested in the arts in their broadest manifestation, for example art, music, writing, composing, dance, design and the like.
- *Social.* Activities centred on helping or caring for others. High scorers tend to express an interest in charitable work, involving caring for the elderly, children with special needs or counselling, teaching and generally assisting others to achieve their potential.
- *Enterprising.* Activities involving the attainment of objectives through people. High scorers generally express an interest in managing or leading others or taking charge of situations. As

such, they are attracted to business-related situations where they are able to exercise leadership and managerial skills and may achieve public acclaim.

- *Conventional.* Activities involving organising, administration and well-established work practices. High scorers enjoy developing and maintaining systems, operating business machines, as well as doing paperwork, bookkeeping and accountancy.

In investigating the structural validity of Holland's hexagonal model in the South African context, Morgan, De Bruin, and De Bruin (2015) found that the structural validity of Holland's hexagon ordering model in South Africa is tenable and that its application across diverse contexts may not be as problematic as originally thought. Accordingly, Holland's hexagonal may be applicable to the South African context and career assessment and counselling based on the model can proceed if interest inventories are used. According to Foutch et al. (2014), Holland's personality and occupational types theory is recognised as one of the most important and influential in the field of career development and vocational psychology. Even in the context of globalisation and rapid change, Foutch et al. (2013) argue that Holland's theory will continue to hold promise for scholars and vocational psychology and guidance practitioners. A study conducted by Houston, Harris, Howansky, and Houston (2015), which investigated the relationship between competitiveness and the occupational interests of undergraduates prior to ending the workforce, and then again after 15 years, found that competitiveness is related to the Investigative and Realistic types of Holland's theory.

Another factor to consider in examining the role of vocational interest in predicting work behaviour is the notion that interest predicts work performance (Nye et al., 2017). Nye et al. (2017) examined the validity and utility of interest congruence for predicting work outcomes in the context of broader P–E fit theories. The findings of two previous meta-analyses (reported by Nye et al., 2017; Van Iddekinge, Roth, Putka, & Lanivich, 2011) provide evidence for the utility of interest assessment in personnel settings, and highlighted potential mechanisms such as motivation and P–E fit for the relationship between interests and performance. In terms of P–E fit, Nye et al. (2017) based their investigation on Holland's (1997) personality and occupational types theory and his concept of congruence. A challenge highlighted by Nye et al. (2017) is that most jobs require employees to perform a variety of tasks that are associated with multiple interest domains. Therefore, examining congruence using only the first letter codes of the individual and occupation ignores the additional information that can be provided by examining a more comprehensive conceptualisation of congruence. According to Nye et al. (2017), many other indices of

congruence have been introduced, leading to the expectation of a more comprehensive comparison of individual and occupational profiles than that suggested by Holland's original conceptualisation of congruence. The results of the study of Nye et al. (2017) support earlier findings by Van Iddekinge et al. (2011) and Nye et al. (2017) that interests are moderate predictors of performance on the job. In terms of operationalisation of interest, congruence requires more information than matching the first letter code of the individual and occupation.

Certain secondary ideas of Holland's (1997) theory can be summarised as follows (Coetzee & Roythorne-Jacobs, 2012; Gottfredson & Johnstun, 2009; Schreuder & Coetzee, 2011; Sharf, 2010):

- *Level of congruence and typological resemblance.* The degree to which environmental models and personality types are related to other models is represented by a hexagonal arrangement. Holland's (1997) theory postulates that individuals seek and persevere in congruent environments and avoid and leave incongruent environments – similarly, environments attract and retain congruent persons.
- *Level.* Holland's (1997) theory postulates that individuals differ in their capacity for coping successfully with complex environmental demands; and occupational, educational and other environments differ in terms of the complexity of the demands they make on those who inhabit them. In Holland's (1997) theory, a level dimension distinguishes both occupational environments and people of the same RIASEC type. As a result, the *Dictionary of Holland Occupational Codes* (Gottfredson & Holland, 1996; Prediger, 2002) provides not only a RIASEC classification for most occupations in the United States environment but is also an indicator of the substantive complexity of these occupations. The occupational codes and impact on P–E fit will be discussed in more detail in Chapter 3. The impact of Holland's (1997) levels is also in congruence with various contemporary models and theories such as the Stratified Systems Theory (SST) of Elliot Jaques (Jaques, 1989, 1996) and Jaques and Cason (1994) and the Viable Systems Model (VSM) of Stafford Beer (Beer, 1989). Both these theories postulate that effective functioning on a particular level in the actual workplace depends not only on cognitive skills but also on other factors, for example personality, motivation, interpersonal skills, interests, values, personal passion, experience and knowledge.
- *The impact of differentiation on the crystallisation of interests.* Differentiation refers to a person or environment that represents a single type, for example only enterprising.

However, should an environment or a person represent different RIASEC types to the same degree (such as enterprising, investigative and realistic), the person and/or environment will be regarded as undifferentiated. If, for example, a person or environment indicates an IAR type and the assessment indicates a high I score but much lower levels of A and R, the person and/or environment will be deemed to be differentiated.

- *Consistency.* Consistency refers to the degree to which a person's two primary (top) RIASEC types are similar. Types on opposite corners of the Holland's hexagon may be regarded as opposites in many respects, while types on adjacent corners (e.g. Realistic, Enterprising and Social) may be regarded as quite similar. Although nobody matches any single type, everyone resembles some types more than others (Arnold & Randall, 2010).

- *Identity.* Vocational identity refers to the clarity of focus of an individual's vocational preferences, aspirations and self-perceptions. Environmental identity refers to the focus and clarity of the demands, goals and expectations of its inhabitants. In theory, both individuals and environments that are high in identity more clearly display the characteristics of Holland's (1997) hexagon or types that each most resembles.

Extensive testing of Holland's theory suggests that his constructs are valid (Sharf, 2010; Zunker, 2006). The RIASEC framework is particularly useful because it provides an easy framework for conceptualising all occupations, and there are also a number of valid, reliable instruments based on the theory that can be used by career counsellors (Schreuder & Coetzee, 2011). According to Schreuder and Coetzee (2011), the theory can be applied in career counselling, recruitment, personnel selection and placement.

Disadvantages of Holland's theory of personality and occupational types (Holland, 1997) include (Schreuder & Coetzee, 2016) the potential simplicity of its application, which can lead to the possible misuse of results. Less experienced or unaware counsellors may allow the test results to lead to recommendations of a limited number of career choice possibilities. In addition, personality–environment fit is not absolutely applicable to the jobs available in the existing job market.

There is good evidence to show that the RIASEC type and interest scores are predictive of individuals' choices of academic majors and careers (Betz, 2008). According to Nauta (2013), meta-analyses have also supported Holland's prediction that P–E congruence with respect to the RIASEC types is associated with favourable outcomes in terms of job satisfaction. Once

individuals have identified career choices, Holland's theory supports the practice of removing real or perceived barriers to promote the seeking of congruent work environments (Nauta, 2013).

In summary, Holland's personality and occupational types theory is regarded as the most important and influential theory in the field of career development and vocational psychology. The main ideas of Holland's theory relate to the impact of the environment on careers in that the work environment is categorised into six environmental types (RIASEC) to guide occupational choices. In terms of Holland's theory, it is critical to understand the extent to which an individual will fit into these environments, and to measure the P–E interaction in terms of the level of congruence between individual vocational preferences, aspirations and self-perceptions against the criteria defined by the RIASEC framework.

Advantages of Holland's personality and occupational types theory include the fact that the constructs are valid, the typology provides an easy framework for conceptualising occupations and the theory can be applied to career counselling, recruitment, selection and placement scenarios. The disadvantage is that less experienced/unaware vocational counsellors may limit the value of test results and career choices owing to a lack of understanding of the degrees of P–E congruence regarding occupation. In terms of work-related outcomes, research as cited in Nauta (2013) supports the validity of Holland's predictions for congruence in relation to career choice, satisfaction and performance. There is good evidence to show that the RIASEC type and interest scores are predictive of individuals' choices of academic majors and careers (Betz, 2008).

Morgan and De Bruin (2018) investigated the structural validity of Holland's hexagon of vocational personality types in Africa to explicitly examine the cross-cultural transportability of Holland's theory across several different African countries. The study found that the results did not support the predicted RIASEC ordering of types, for example estimated angular locations revealed disordering between the types for the East African region (RASECI) with the Investigative type falling between the Realistic and Conventional types (Morgan & De Bruin, 2018). For the Southern and West African regions, the correct circular ordering was observed (RIASEC) (Morgan & De Bruin, 2018). In terms of work-related outcomes, research as cited in Nauta (2013) supports the validity of Holland's predictions relevant to congruence in career choice, satisfaction and performance. These results hold promise for the cross-cultural transportability of Holland's theory in Africa and imply that practitioners and researchers may potentially tap into the wealth of practical and theoretical knowledge that has accumulated about Holland's theory. There may

consequently be merit in continuing work on validating and building interest inventories that operationalise Holland's vocational personality types in Africa (Morgan & De Bruin, 2018).

c. Theory of work adjustment and correspondence

P–E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) – originally referred to as the theory of work adjustment (Dawis et al., 1964) – was also developed from the trait-and-factor approach to career counselling. The theory of work adjustment (TWA) focuses primarily on adjustment to work, while P–E correspondence (PEC) focuses on the 'fit' of a person for a particular work environment (Schreuder & Coetzee, 2011).

The TWA was developed by Dawis and Lofquist (1984), as the product of more than five decades' research at the University of Minnesota (Eggerth, 2008). The TWA views work as an interactive and reciprocal process between the individual and the work environment (Dawis & Lofquist, 1984). According to Eggerth (2008), the TWA provides a framework in terms of which to predict the outcomes of the match between the individual and the work environment (predictive model) and to describe the ongoing process of interaction (work adjustment) between worker and environment (Eggerth, 2008). In the context of the current study, the focus would be the role of TWA as a predictive model in the context of P–E fit in relation to career path congruence. Correspondence refers to the match between worker needs and work environment reinforcers and may be used to predict job satisfaction (Dawis & Lofquist, 1984). The match between worker abilities and the behavioural requirements of a job predicts satisfactoriness (Eggerth, 2008; Swanson & Schneider, 2013). The term 'correspondence' also refers to the degree to which worker and workplace fulfil the other's requirements. Given mutual satisfaction, tenure (remaining on and being retained in a job) is predicted (Eggerth, 2008). Correspondence relates to the degree of congruence between the needs and expectations of the individual and those of the environment/organisation (Dawis & Lofquist, 1984; Dawis, 1996; 2005).

Based on Schreuder and Coetzee (2011), the central points of work adjustment/P–E correspondence are summarised as follows:

- Work involves the interaction between the individual and the work environment. In this interaction the environment has requirements of the individual concerning work performance and the individual has requirements of the environment concerning compensation for work performance.

- If the requirements of both are met, the individual and the work environment are mutually responsive – that is, they achieve correspondence. Work adjustment involved the ongoing process of achieving and maintaining correspondence.

- There are two criteria work adjustment, namely, the satisfaction of the individual with the environment and the satisfaction of the environment with the individual.

- Both satisfaction and satisfactoriness are necessary if the individual is to remain in the work environment. Tenure is therefore the result of both factors and is also the main indicator of work adjustment.

- Work adjustment (as well as tenure) can be predicted from the correspondence between the individual's so-called work personality and the work environment; to predict this correspondence the two variables should be described in corresponding terms.

- Corresponding terms are structure and style. The structure of the individual's work personality involves skills and needs, which derive from values. Work personality style involves the typical ways in which the individual interacts with the environment, including celerity (speed of responding), pace (level of activity), rhythm (pattern of pace) and endurance (duration of responses). The structure of the work environment involves skills requirements and need reinforcers (stimuli that are conducive to need satisfaction), while the style of the work environment involves requirements for celerity, pace, rhythm and endurance.

The advantages of this theory can be summarised as follows (Schreuder & Coetzee, 2011):

- The strength of the theory lies in a solid research foundation.
- Another strength of this theory is its applicability to many issues related to work adjustment, for example problems concerning co-workers, superiors, boredom and incapacity to meet work requirements (Sharf, 2010).
- The model can be used to assess resistance to change, flexibility and perseverance in both the individual and the organisation.
- It can also indicate how difficult an adjustment problem is and how much adjustment can be realistically expected (Dawis, 1996).

Both the Minnesota TWA (Dawis & Lofquist, 1984) and Holland's personality and occupational types theory (Holland, 1997) are important from a P-E vocational fit perspective, yet share a conceptual foundation within the broader study of P–E psychology (Swanson & Schneider, 2013).

The TWA consists of two models: the *predictive model*, focusing on the variables that explain whether individuals are satisfied with their work environments, which in turn predicts tenure in their work environments; and the *process model*, focusing on how the fit between individuals and their environments is attained and maintained (Swanson & Schneider, 2013). In addition, the TWA proposes two sets of parallel characteristics (Swanson & Schneider, 2013): an individual has a set of needs and values that may (or may not) be met by rewards available in the work environment; and secondly, the work environment has a set of job requirements that may (or may not) be met by the skills and abilities that the individual possesses. If an individual's needs are met by the work environment, then the person and the environment are in correspondence (determining satisfaction or dissatisfaction); likewise, if the requirements of the work environment are not met – in either or both instances – then the individual and environment are in discorrespondence (determining satisfactoriness or unsatisfactoriness) (Swanson & Schneider, 2013).

The TWA also emphasises the measurement of abilities and values to facilitate a match between the individual's characteristics and those of the work environment (Swanson & Schneider, 2013). The concept of abilities and its implication for person–career path congruence will be discussed in Chapter 3.

The TWA process model focuses on how adjustment occurs and how it is maintained (Swanson & Schneider, 2013) with adjustment styles referring to the individual's ability to react to the discorrespondence between his/her own abilities and skills and what is required in the work environment (Swanson & Schneider, 2013). The TWA process model and adjustment styles will be discussed in more detail under the theory of TWA/P-E Correspondence in chapter 3.

In summary, work adjustment/P–E correspondence involves the interaction between individual and work, with mutual satisfaction (the requirements of both the individual and the organisation/workplace are met) being critical to person–career path congruence. P–E fit/correspondence is important in both the TWA and correspondence (Dawis & Lofquist, 1984; Dawis, 1996; 2005), as well as Holland's (1997) personality and occupational types theory. In terms of the TWA/correspondence, two models are important, namely, the predictive model (focuses on variables that explain whether an individual is satisfied with the work environment, thus predicting tenure in work environment), and the process model (focuses on how the fit or correspondence between individuals and work environment is obtained and maintained). In the context of this study, the focus will be on the predictive model.

Measuring the fit or correspondence involves considering Holland's (Holland, 1997) personality and occupational types theory and abilities. Adjustment styles are important to ascertain how much discorrespondence will be tolerated by the individual and the organisation/work environment. By implication, an individual will match their profile (career anchor preferences, career interests and abilities manifested through an integrated competency set) to the requirements of the job and/or career path and may compromise on areas of discorrespondence. However, if the level of discorrespondence is high, the individual may seek an alternative career path within the organisation or exit the organisation entirely. Similarly, organisations will determine which competencies related to a job or career path are essential and tend to accommodate individuals if essential or core requirements are met by the individual's profile. However, if these are not met with a reasonable degree of correspondence, the individual may be considered for more suitable jobs within the organisation or an exit agreement will be reached within the parameters of relevant labour legislation. In the context of this research, the notion of P–E fit will be explored to establish the impact of person–occupational congruence as a result of the level of congruence between an individual's career anchor preferences, career interests, perceived abilities, and occupational and organisational fit guided by occupational and organisational career pathway demands, and in the context of Holland's (1997) personality and occupational types theory, and the TWA and correspondence-fit theory (Dawis & Lofquist, 1984; Dawis, 1996; 2005).

2.2.2.2 Person-in-environment perspectives

The person-in-environment perspectives view career and career development as embedded in the larger context of social and environmental interchange and relationship (Shoffner, 2006). For the purposes of the present study, an individual's career anchor preferences, career interests and abilities have to be considered in the greater societal context and, in particular, the work environment to contribute to a better understanding of P–E fit and correspondence, a critical component in predicting career pathing congruence.

For the purposes of this study, the impact of the following theories in terms of person in environment perspectives will be explored:

- Cook, Heppner and O'Brien's race/gender ecological theory
- Pryor and Bright's chaos theory of careers

a. Cook, Heppner and O'Brien's race/gender ecological theory

The race/gender ecological model of career development recognises that by their very nature, humans live interactionally in a social environment. The model posits that every person has both a gender and a race and that these factors decisively shape the individual's career throughout life as she or he encounters opportunities or obstacles because of race or gender. Although individuals of the same biological sex or race may encounter similar circumstances because of their demographics, each career path is unique because of individual circumstances and the unique interactions of their subsystems (Gysbers, Heppner, & Johnston, 2003). Vocational or career behaviour is therefore understood as an 'act-in-context' in which the context is essential to the explanation and meaningfulness of the individual's behaviour (Gysbers et al., 2003).

In the ecological approach, the counsellor goes beyond the co-construction of meaning to address specific environmental factors that may be influencing the client's optimal career development. The focus in career counselling is often on changing the individual's interactions with the environment, which involves clarifying and affirming life options, managing multiple roles, obtaining needed resources, creating healthy work environments, and linking individuals with role models and mentors (Shoffner, 2006).

In summary, gender and race factors that shape careers, either through opportunities or obstacles, are deemed important factors in the study of person–career path congruence.

b. Prior and Bright's chaos theory of careers

Chaos theory is a systems theory approach to career counselling that emphasises complexity and change. The premise is that in a complex, changing and connected world, people need adaptability and resilience to respond to problems and change, as well as creativity and imagination to recognise and develop opportunities for personal, community and societal betterment. In this regard, it is claimed that the chaos theory of careers provides a framework for understanding discontinuous change and unpredictable career decisions (Pryor & Bright, 2009).

The chaos theory of careers seeks to understand individuals as complex, dynamic, nonlinear, unique, emergent, purposeful open systems existing and interacting with an environment comprising systems with similar characteristics. The client is understood as a system comprised of interacting subsystems, and as a subsystem of a larger system with which he or she interacts. The challenge of career counselling is to understand which the relevant subsystems are, as well

as the systems and super systems for the client's career development and decision-making. Issues of complexity, change, recursive influence, adaptability, uncertainty and chance are likely to figure prominently (Pryor & Bright, 2003).

Pryor and Bright (2003) claim that chaos theory provides insight into complexity, adaptation, change, chance, creativity and history as systemic characteristics of individuals and the environments in which they operate. In career terms, individuals are potentially affected by a multitude of influences, including those that were focused on traditionally, such as abilities, interests, values and traits, as well as health, age, gender, culture, location, emotionality, family of origin, cultural expectations, socioeconomic status, labour market fluctuations, transport options and educational levels. As a result of such complexity, the potential for change and the interaction among such career influences are both likely and unpredictable. The unpredictability of change in such systems gives rise to uncertainty, which all individuals experience at least at some time (Pryor & Bright, 2009).

Chaos theory characterises complex, dynamic systems as being inherently unpredictable. Chaotic open systems have the capacity to self-organise over time by means of a process of attractors – the end state toward which a dynamic system moves (Pryor & Bright, 2003). Chaos theory differentiates between four major categories of attractors:

- *Point attractor* – the characteristic pattern of which is to be drawn to or repelled by a particular activity or state (e.g. people pursuing natural instincts).
- *Periodic attractor* – the characteristic pattern of which is oscillation between two or more activities or states, also seen as a repeating and self-maintaining process (e.g. seasonal increase in the demand for employment).
- *Torus attractor* – the characteristic pattern of which is organised complexity repeating itself; the typical end state of an open system. Such an attractor is goal seeking, tending to order and achieving a final state.
- *Strange attractor* – the characteristic pattern of which is unpredictable complexity, emerging as a self-organising structure or shape over time. Strange attractors are characteristic of chaotic systems.

According to Pryor and Bright (2003), the notion of strange attractor provides a way of understanding career-related behaviour and career decision-making, as it is experienced in the 21st century world of work. For example, people who have remained in the same type of job for

many years with little satisfaction or achievement may be functioning with a periodic or torus attractor that constrains career choices. The chaos theory approach to career counselling emphasises influences rather than causes (e.g. someone may be drawn to or repelled by an occupation as a result of the fact that a parent worked in that particular occupation).

The system arranges itself around a new attractor – or produces an alternative structure. The career counselling approach encourages a greater awareness and acceptance of change and also highlights its unpredictability and far-reaching consequences. A theoretical chaos approach enables the development of taxonomies of influences on career development, which may be construed by the individual in collaboration with a career counsellor. The task for the career counsellor may be to identify the narrow parameters (perhaps concern about security, unwillingness to travel, etc.) and then introduce other factors, thereby increasing the complexity of the perceived influences in order to demonstrate to the individual the validity of other career trajectories. The chaos theory approach provides a platform on which to introduce notions related to the development of skills portfolios, and preparing for happenstance events (Pryor & Bright, 2003).

In summary, people need adaptability and resilience to respond to problems and change, as well as creativity and imagination to recognise and develop opportunities for personal, community and societal betterment. Owing to rapid changes in the world of work, it has become more and more difficult to make career choices. People who have remained in the same type of job for many years with little satisfaction or achievement, may be functioning with a periodic or torus attractor that constrains career choices, whilst those who follow multiple career paths have to deal with changing occupational requirements. As the workplace changes, so too do the occupational requirements; some occupations become extinct, while others require staying abreast of changes, whether these be related to technology, knowledge, new skills sets, and even vague guidelines, in the sense that many individuals holding various positions are required to understand the progression of the occupation base in the face of new demands. As stated earlier, the chaos theory approach provides a platform on which to introduce notions of the development of skills portfolios and preparing for happenstance events (Pryor & Bright, 2003).

2.2.2.3 Systems theory

Systems theory was proposed as a potential overarching framework for dealing with many issues related to human behaviour, and includes contributions from the disciplines of physics, biology,

anthropology and psychology (Patton & McMahon, 2006). Within the context of career counselling, the systems theory framework (STF) provides a map for understanding the origins of career counselling and the challenges it now faces (Patton & McMahon, 2006). The STF proposes a dynamic process, depicted through process influences, recursiveness, and change over time and chance (Patton & McMahon, 2006).

The characteristics of the STF can be summarised as follows (Patton & McMahon, 2006):

- Each system is an open system and therefore subject to external influences and may also influence which is beyond its boundaries. This interaction is termed recursiveness in the STF.
- It is well acknowledged that influences on an individual may change over time, resulting in the role of chance in career development.
- All the systems of influence are located within the context of time (past, present, future), all of which are inextricably linked.

In summary, the STF accommodates both the content influences (includes personal qualities and characteristics intrinsic to individuals, as well as influences from the context in which they live including the people and organisations with whom they interact, society and environment) and process influences (specifically recursiveness, i.e. the interaction between influences) that change over time and the influence of chance on an individual's career development (McMahon, & Watson, 2009). Content influences are termed the 'individual system', 'social system' and 'environmental-societal system' (McMahon & Watson, 2009).

2.2.2.4 Life span developmental theory

Super (1990) postulates that an individual's career choice is the result of his or her self-concept. Self-concept represents one's own view of one's personal characteristics (the personal meaning of own abilities, interests, values and choices). Self-concept develops through an individual's interaction with the environment, in which he or she develops concepts of him/herself in certain roles, such as student, worker, friend or family member. The degree to which a person feels that they can implement their self-concept through their work choice influences their level of satisfaction in a particular occupational environment (Schoffner, 2006). One's self-concept may be modified in the process of adjustment (Schoffner, 2006). Career adjustment is related to career maturity, which includes the types of behaviour conducive to adjustment. It refers to the general types of behaviour in specific life stages, as well as to prior aspects of behaviour manifested in

the particular psychological developmental tasks of a given stage (Coetzee & Roythorne-Jacobs, 2012; Super, 1990). Career maturity is not related to age, but rather amounts to readiness to make career decisions and to cope with the developmental tasks of particular life stages. Super (1990) proposes five life stages, representing Growth (birth to 12–14 years), Exploration (adolescence, 14–25 years), Establishment (early adulthood, 25–45 years), Maintenance (middle adulthood, 45–65), and Decline (old age, from 65 years).

Super's (1990) life stages are considered for this research based on the relevance of the characteristics of each stage in relation to the research population (both quantitative and qualitative). In terms of Super's (1990) career life stages and in the context of this research, *Exploration (*focus on late adolescence, 18–25 years*)* is characterised by crystallising, specifying and implementing the self-concept; *Establishment* is characterised by stabilising, consolidating and advancing, a period of trial in the late twenties and a period of stabilisation in the thirties and early forties; and *Maintenance* is characterised by holding, updating and innovating. For the purposes of this research, Super's (1990) life stages of Growth and Decline are excluded.

The most important elements of each career life stage for this study are the challenges faced by individuals, and the developmental tasks relevant in the context of self-related and work-related developmental tasks. A summary of these elements is provided in Table 2.2, adapted from Coetzee and Roythorne-Jacobs (2012, p. 59, 170–171).

Table 2.2

Super's Life Stages Model

LIFE STAGE	CHALLENGES	CHARACTERISTICS	SELF-RELATED DEVELOPMENT TASKS	WORK-RELATED DEVELOPMENTAL TASKS
Maintenance (middle adulthood, 45–65 years)	Redefining one's identity, clarifying one's values and philosophy of life, adjusting to changes in family life, utilising more leisure time and finding new occupational satisfactions as training and experience becomes consolidated	Holding, updating and innovating	Realistic self-assessment, opportunities to learn new skills, and the sharing of skills and expertise; Setting new priorities	Maintains level of achievement despite challenges of competition, rapid changes in technology, and family
Establishment (early adulthood, 25–45 years)	Achieving independence and responsibility, establishing one's identity, finding a place in and contributing to society, and becoming established in an occupation and in family life	Stabilising, consolidating and advancing, a period of trial in the late twenties and a period of stabilisation in the thirties and early forties	Works to make one's place in chosen field of work; settling down in chosen permanent position; learning to relate to others; developing a realistic self-concept	Pursues advancement (e.g. promotion, additional responsibility); economic stability; succession of job changes before a final choice (trial); during stabilisation, security and advancement become priorities
Exploration (late adolescence, 18–25 years)	Quest for identity in terms of self and gender roles and roles in the broader society	Crystallising, specifying and implementing self-concept	Connect self-concept to world of work (developing an occupational self-concept); tentative career choices – learning more about opportunities; trial and error (exploration and experimentation with possible selves)	Identifies types of work through part-time jobs and job shadowing; makes transition from school to work or further education

Adapted from Coetzee and Roythorne-Jacobs (2012, p. 59)

2.2.2.5 Career construction and life design

According to Savickas (2012), the 21st century world of work is characterised by feelings of anxiety and insecurity. Careers should be viewed not as a lifetime commitment to one employer but as a recurrent selling of services and expertise to a series of employers. Therefore, entering the job market today requires individuals to have deeper self-knowledge and greater confidence than before. Savickas (2005) views career theory from a social constructionist point of view. Amundson, Harris-Bowlsbey, and Niles (2009) view Savickas's career construction theory as a 21st century extension of Super's theory. From an individual's perspective, the focus of the present study will be to explore the level of congruence between an individual's career anchor preferences, career interests and abilities and qualitative feedback as part of an individual's life portrait (Savickas, 2005) to enhance person–occupational/organisational career path congruence. Whereas Super (1990) regarded the choice of an occupation as the implementation of the self-concept, Savickas (2005) proposes that individuals can create a career and give it meaning. In the context of Savickas's (2005) constructivist theory, Holland's hexagon of personal orientations (personality types) and Super's concepts of the career self-concept and life stages are seen as social constructions. Individuals make choices that express their self-concepts and substantiate their goals in the social reality of life. One's career enfolds (forms a holding space) as one makes choices and develops a narrative or story of one's life. Because the construction of one's career changes throughout life and is constantly developing, adaptation rather than stages of life or maturity itself is important (Sharf, 2010).

Career construction theory describes four areas of client narratives: vocational personality, developmental tasks, dimensions of career adaptability and life themes.

   a. *Overview of a constructivist approach to person–career path congruence*

The constructivist approach to career counselling is anchored in postmodern philosophy, which asserts that individuals construct or perceive their own reality or truth, and that there is no fixed truth (Neimeyer & Stewart, 2002; Sharf, 2010). This approach focuses on understanding clients' values or personal constructs (the way they interpret and view their lives). The theory implies the active involvement of an individual in the career counselling process (through engagement and discovery) to explore career paths with the individual (Axinte & Şoitu, 2013). Constructivism includes meaning making, narratives, life themes and self-creation in work and career (Kang, Kim,

& Trusty, 2017). Clients' careers are seen as a major means of giving their lives role clarity and meaning (Savickas, 2005; Sharf, 2010).

b. Vocational personality

In the context of career construction theory, Holland's (1997) theory of personality and occupational types is used to help both the client and the counsellor to understand the client's story (not to obtain congruence between the personality type and the work environment). According to Savickas (2005), the traits that constitute Holland's (1997) personality and occupational types are socially constructed attitudes, interests, abilities and values that represent a person's social reputation and his or her own self-concept. Each of these traits clarifies why individuals engage in a certain type of vocational behaviour (why they chose a certain occupation) and how it expresses a life theme. The career counsellor listens to the client's story by means of a structured process, using Savickas's (2005) career construction interview (or Life Story Index). Holland's theory of personality and occupational types is used as a lens or way of looking at and listening to the client's view of the story to gain a deeper understanding of the core life themes (reflected in the client's interests, attitudes, abilities and values) that give meaning to the client's story. The information that comes from the Career Construction Interview is then used to determine which types the client most closely resembles. The career counsellor subsequently helps the client to develop a success formula by focusing on the strengths of the identified types (Sharf, 2010). Clients are guided to see with clarity what (career-wise) makes them feel happy and successful, and how these relate to the world of work.

c. Developmental tasks

The complexity and uncertainty of the rapidly changing 21st century world of work demand flexibility and adaptability throughout the life span. In the context of career construction theory, career adaptability is concerned with how individuals construct and manage their careers (how they decided on a specific occupation). The discussion of how one dealt with difficulties at school or at work relates to career adaptability (Sharf, 2010). Adaptability consists of the attitudes, behaviours and competencies that individuals use in order to make the adjustments needed in their work environment or their career changes. Well-developed adaptability enhances the developmental processes needed to implement the self-concept at work. When dealing with career adaptability, individuals face several developmental tasks. Super's (1990) theory of life stages provides a lens or conceptual framework for organising developmental tasks. Career

counsellors work with the stories that are relevant to the developmental tasks to help the client deal with barriers or to make the adjustments needed in their lives or careers (Sharf, 2010).

Dealing with career issues in the context of the developmental tasks associated with career adaptability, the story individuals construct during the career construction process represents a direct link to Super's theory of life stage developmental tasks which individuals have to face and which are reflected in their stories (Coetzee & Roythorne-Jacobs, 2012). According to Coetzee and Roythorne-Jacobs (2012), an individual's story reflects the particular life stage and developmental task they are facing at a particular point in their career.

d. Dimensions of career adaptability

As stated under section 2.1.1, adaptability consists of the attitudes, behaviours and competencies or skills that individuals use to make the adjustments needed in their work environment or when changing careers and is thus concerned with the ability of an individual to prepare for future career tasks, take ownership of own career development and to deal with challenges to solve career related problems. Career adaptability refers to an individual's readiness to cope with changing work and working conditions (Coetzee & Roythorne-Jacobs, 2012).

As stated under section 2.1.1, adaptive individuals are those who display positivity by being curios and exploring possible future scenarios. Typically, they will display self-confidence (or self-efficacy) to pursue their aspirations (Schreuder & Coetzee, 2011), and tend to master additional skills required by their changing circumstances (Hall, 2002). The purpose of the life-design intervention is, therefore, to help people meet the career challenges of the global economy and digital age by increasing the metacompetencies of adaptability and identity (Savickas, 2013). In defining employability as a trait, it is critical for individuals to adapt to changing environments and realign their careers accordingly (Fugate, 2006; Guilbert, Bernaud, Gouvernet, & Rossier, 2016).

e. Life themes

Clients' unique experiences create one or more life theme which represents a problem that needs to be solved or a value that needs to be attained. Similar to Schein's concept of the career anchor, the life theme is a driving force to express one's self-concept and to give meaning to work and other life roles. A central role of the career counsellor in this regard is to assist clients to identify life themes and then to create ways to play out these themes in their work, giving them deeper personal meaning and also making a contribution to society (Amundson et al., 2009). The

principal task for the counsellor during the interview is to listen, not for the facts, but for the glue that holds the facts together while at the same time trying to hear the theme or secret that brings the life together as a whole (Hartung, 2007, p. 115).

For the purposes of this research, the life portrait as defined by Savickas (2005) represents an important factor to consider. Savickas (2005) uses an eight-step interpretive routine, which emphasises a career construction framework when identifying and interpreting an individual's core life themes with the intention of crafting a success formula through strength analyses, followed by a ninth step to represent an individual's life portrait (Coetzee & Roythorne-Jacobs, 2012; Savickas, 2005; Sharf, 2010). Crafting a success formula entails reviewing counselling goals, attending to verbs, examining headlines of the recollection, moving from preoccupation to occupation, role models as a suggestion for a plan, profiling adaptability, and appraising vocational personality (Coetzee & Roythorne-Jacobs, 2012; Savickas, 2005; Sharf, 2010).

The life portrait aims to highlight the emotional realities and themes of the individual, representing a tentative sketch mirroring the observations of the counsellor, thus representing a true reflection of the individual and his/her feelings, with the individual being regarded as the expert of his/her story (Savickas, 2005; Sharf; 2010).

In summary, career construction and life design make a valuable contribution to the career intervention (qualitative study) context of this study in that they provide valuable insight to establish the correlation between an individual's career anchor preferences, career interests and abilities and qualitative feedback as part of an individual's life portrait, derived from life themes translated into career life themes. Clients are guided to see with clarity what (career-wise) makes them feel happy and successful, and how these relate to the world of work, enabling a career developmental approach and defining suitable developmental tasks in an ever-changing work environment. The ultimate aim of career construction and life design is to equip career counsellors with the skills and strategies needed to help people fit careers into their lives rather than fit their lives into their work (Maree, 2013).

Table 2.3 represents key insights gained into the constructs and applications of the various theories in relation to career path congruence.

Table 2.3

Core Insights and Application of Theories

Theory	Key insights	Application in career path congruence
Trait and factor theories (Parson's trait and factor theory; Holland's theory of personality and occupational types)	Congruence between occupational requirements and individual characteristics is important for career and job success. Successful performance on critical occupational tasks requires a unique trait set (whether mental, numerical or verbal ability) and relates back to the minimum competency requirements of the occupation.	The higher the congruence between individual traits or characteristics and occupational requirements, the more likely the individual will be to perform the tasks and attain greater personal and career satisfaction.
Person–environment fit theories (Holland's theory of personality and occupational types; Dawis & Lofquist's theory of work adjustment and P–E correspondence)	It is important to understand the extent to which an individual will fit into the work environments, and to measure the P–E interaction in terms of level of congruence between individual vocational preferences, aspirations and self-perceptions against criteria. Mutual satisfaction (requirements of both the individual and the organisation/workplace are met) relies on the ability of individuals and career counsellors in the workplace to match the career anchors, career interests and abilities profile of an individual to that of the job requirements and by default the corresponding career pathways.	It provides an easy framework for conceptualising occupations, and the theory can be applied to career counselling, recruitment, selection and placement scenarios. The disadvantage is that less experienced/unaware vocational counsellors may limit the value of test results and limit career choices due to a lack of understanding of the degrees of P–E congruence regarding occupation.
Person-in-environment perspectives (Cook, Heppner & O'Brien's race/gender ecological theory; Pryor & Bright's chaos theory of careers)	Gender and race factors that shape careers, either through opportunities or obstacles, are deemed important factors in the study of person–career path congruence. Adaptability and resilience to respond to problems and change, as well as creativity and imagination to recognise and develop opportunities for personal, community and societal betterment play important roles in person-career congruence. Individuals and the work environment represent a dynamic integrated system that guides individual–career congruence towards a mutually beneficial experience for both individuals and organisations.	Career counselling and guidance must consider gender and race influences on career decision-making processes. Individuals should develop skills portfolios to promote greater adaptability, employability and person–career congruent decision-making when considering career path alternatives relevant to the contemporary world of work.
Life span developmental theory (Super, 1990)	The most important elements of each career life stage are the challenges faced by individuals, as well as the developmental tasks in the context of self-related and work-related developmental tasks. Age and life stage are deemed important in person-career path congruence guidance.	Clear understanding of the characteristics and challenges of the various career life stages will enable counsellors to be more effective in aligning career-related services to their clients (organisations and individuals). Insights into the career life stages of the existing workforce will allow proper and targeted career management programmes in organisations.
Career construction and life design (Savickas, 2005, 2012)	It provides valuable insight to establish the level of congruence between an individual's career anchor preferences, career interests and abilities and qualitative feedback as part of an individual's life portrait, derived from life themes translated into career life themes.	It provides a framework that enables career counsellors to better understand the individual's career needs from a qualitative perspective and in the context of their career perceptions based on life theme building blocks constructed over a career life span.

2.3 CAREER PATHING IN AN ORGANISATIONAL CONTEXT

Research shows that although P–E fit and/or congruence is a challenging concept to consider in today's uncertain and rapidly changing employment context, it is important for a better understanding of career satisfaction and wellbeing, and the way in which can this be achieved by aligning career anchor preferences, career interests and abilities to organisational career pathway offerings. In the context of this research, organisational career pathway offerings will be explored in the context of career pathways, as proposed by various theoretical and industry frameworks. Career pathways (such as the Minnesota Career Fields, Clusters & Pathways chart, Occupational Information Network [O*NET] and the World of Work Map (WWM: Prediger, 2002) provide a clear roadmap for individuals seeking to align their career anchor preferences, career interests and abilities to educational, industry and organisation career pathways (career roadmaps defined in terms of job profile, competency and expected behaviours and in a meaningful sequential career pathway context).

Using the principles of P–E fit or congruence postulated by the trait-and-factor theories, the current research focuses on the notion of *career path congruence,* which is seen as the match (or level of congruence) between an individual's preferences, interests and abilities (person characteristics) and the career pathway of the job within a particular organisation (environmental characteristics).

To realise their strategic intent, organisations need to ensure congruence between organisational capability requirements (such as innovative thinking) and people's capabilities (such as information processing and creative thinking). Accordingly, organisations should invest in their people, develop a variety of flexible multidirectional career paths offering alternative work arrangements, and review career enhancing policies that allow multidirectional careers and deal with work–family balance. To enable organisation–people capability alignment, organisations should ensure that individuals are placed in the right jobs according to their career anchor preferences, career interests and abilities so as to enhance P–E fit or correspondence. Research has shown that organisations should focus on the following to enhance person–career path congruence: recruitment and selection (Greenhaus et al, 2010), development and utilisation of human resources (Greenhaus et al, 2010; Mulhall, 2014) within the context of person–career congruence, management of the career plateau (Greenhaus et al, 2010; Sharma, 2016), management of cultural diversity (Rodrigues et al., 2013; Pryor & Bright, 2003; 2009;), and family responsiveness (Sharma, 2016; Pryor & Bright, 2003; 2009; Patton & MacMahon, 2014) .

2.3.1 Overview of the status of career path congruence

This section will provide a critical overview of the status of career path congruence, and how organisations can apply career management principles and practices to promote person–career path congruence. Many of the areas mentioned will be discussed in more detail as part of Chapter 3. The aim will be to explore various approaches, as well as identify possible challenges and ways to address them.

In terms of P–E fit/correspondence, it is important for the individual and organisation to strive for a state of correspondence in terms of organisational expectations and individual career anchor preferences, career interests and abilities. The purpose of career guidance will be to provide a vehicle for individuals and organisations to facilitate career services in order to promote person–career path congruence. In its national standards for learning and development, the South African Board for People Practices (SABPP) includes career pathways and individual career preferences as considerations when identifying, selecting and implementing the appropriate learning and development interventions in an integrated approach to meet the identified organisational needs and enable employees to develop new knowledge and skills (SABPP, 2017).

Career guidance has become a strategic imperative in South Africa. The South African Department of Higher Education and Training (DHET, 2018) has introduced a 'National Policy for an Integrated Career Development System (CDS) for South Africa' and has applied an integrated career development system, Accordingly, various challenges have been addressed such as the fragmentation of services, inaccurate, irrelevant and inconsistent information, lack of capacity for career development practitioners, the absence of coordination and poor services (DHET, 2018). Relevant to this study, one strategic policy theme relates to the provision of career development services across the individual's lifespan (DHET, 2018). CDS delivery will follow a three-step process, which will focus on strengthening life skills: 1) self-awareness and transition management; 2) developing competencies to understand and act on one's environment – knowledge of the environment and exploration of possible scenarios; and 3) constructing a career plan – vision for the future, planning, execution and follow up (DHET, 2018).

To support the implementation of the CDS, the DHET has published the Competency Framework for Career Practitioners (DHET, 2016) to serve as a benchmark for the minimum competencies required by individual career development practitioners in order to offer CDS in South Africa.

To guide human resource practitioners (in terms of a support structure for career development practitioners) in the workplace, the SABPP has outlined the standards for career management (SABPP, 2017). Career management is seen as an important component of the talent management system, alongside job profiling, skills audits, succession planning, development plans, talent reviews and a communication strategy (SABPP, 2017). The aim of the Career Management Standard is to guide human resource practitioners to develop and implement a Career Management Policy and Procedures which is aligned with the organisation's Talent Management System (SABPP, 2017). Among other things, the policy and corresponding procedures must make provision for the management of accurate, up-to-date employee data on qualifications and skills and accurate job profiling, as well as competency models and illustrative career paths throughout the organisation, thus allowing for flexibility. Provision should also be made for the implementation of a career communication and advice system in partnership with external occupationally directed organisational stakeholders such as universities, colleges and training organisations (SABPP, 2017).

Following the above discussion, the foundation is laid for career management practices in South Africa that promote person–career path congruence in the changing contemporary work environment, with a clear focus on the alignment of individual and organisational career paths in the context of market demands.

2.3.2   Career path modelling and guiding frameworks

From an organisational perspective, it is important to understand the concept of career path modelling to align individual and organisational career path requirements. Career path modelling refers to an understanding of how best to construct and align career pathways to accommodate individual and organisational career path considerations. It relates to efforts by organisations to develop career pathways based on educational, industry and organisation-specific career path frameworks. Various academic and industrial frameworks exist to guide individual career counselling. These frameworks also serve as a basis for career and/or professionally based education programmes and inform frameworks for guiding work and structure in an organisational context.

This section will discuss key elements of career pathing, and explore the various models and frameworks based on educational or academic principles. These include established research

models such as Holland's (1997) personality and occupational types theory, and those based on occupational or job clustering perspectives. Both local (South African) and international work and structure frameworks will be considered, as well as framework inputs derived from organisational models applied in industry.

The key elements of career path modelling in an organisational content include the following (Cao & Thomas, 2013):

- creating a career roadmap (career maps are used to show what a prototypical career looks like in terms of sequential positions, jobs/roles, and stages)
- building job profiles (profiles create distinctions among job roles in career paths by outlining their core responsibilities, skills and requirements)
- identifying core competencies and expected behaviours (competencies should specify differentiating behaviour that is exhibited by outstanding performers, and also serve as performance standards that define expected results in different functions)
- incorporating training and development (link career paths to employee development by prioritising position profile characteristics and identifying key experiences that employees should acquire as they move along the career path), and
- establishing accountability (with the large amount of resources invested in the career pathing process, organisations should create mechanisms to ensure its effectiveness).

Various models exist to illustrate the application of career clusters or areas to group jobs into meaningful career groupings that will enable career counsellors to link jobs in the workplace to career pathways. Career path models include the World of Work Map (Prediger, 2002), the Minnesota career fields, clusters and pathways chart (Minnesota State Colleges and Universities, 2010), the Occupational Information Network (O*NET) System (O*NET Centre, 2007) and the Organisation Framework of Occupations (OFO) 2017(Coetzee, 2013; DHET, 2013).

The models can be subdivided into three categories:

- Models based on educational or academic principles
- Models based on established research such as Holland's (1997) personality and occupational types theory
- Those based on occupational or job clustering perspectives.

2.3.2.1 Models based on educational or academic principles

It is important for alignment between the individual and an organisational career path to consider academic career fields and related career clusters relevant to occupational frameworks. For example, a career in financial auditing requires particular educational qualifications and a common competency set associated with all levels of accountability within the financial auditing environment. For an individual to consider a financial auditing career path, he/she has to acquire the relevant qualification and ensure that his/her career anchor preferences, career interests and abilities are aligned to those of the financial auditing career path within an industry and organisational context.

For the purposes of this discussion the focus of the following sections will fall on a discussion of the various models guiding individual–organisation career path congruence.

a. Department of Education of Minnesota (2007) career fields and clusters

The Department of Education of Minnesota (2007) provides a framework of career fields. The career fields are identified in the segmented ring surrounding the Foundation Knowledge and Skills, which is the organising structure for occupational career clusters and fields. Career fields represent a categorisation framework comprising relevant career clusters related to an occupational grouping. The fields represent the broadest aggregation of careers.

Career clusters represent a grouping of occupations and broad industries into a national classification of 16 clusters which are based on common knowledge and skills (Minnesota State Colleges and Universities, 2010). Career clusters include hundreds of occupations that may be grouped into pathways around which educational programmes of study can be built. Career pathways, which are identified under each cluster heading, represent an organisation of related occupational areas within a specific career cluster. Each of these pathways has identified knowledge and skills validated by industry from which programmes of study are developed (Minnesota State Colleges and Universities, 2010). Accordingly, career fields such as Business Management and Administration are relevant to a particular work and structure category (job family or grouping) based on shared work purpose and a common competency framework. For example, the Finance career cluster includes careers related to banking services, business finance, securities and investment, accounting and insurance. In the workplace, these are related to the financial services industry.

Figure 2.2, which is adapted from the Department of Education of Minnesota (2007), represents a typical career path, indicating the relationship between, for example, the career field (Business, Management and Administration) and the Finance career cluster, comprising various career pathways such as banking services, business finance, securities and investment, accounting, and insurance. This framework will enable organisations to organise the various jobs in the Finance cluster and individuals may align their career anchor, career interests and abilities profile to explore whether options for a career in finance should be explored.
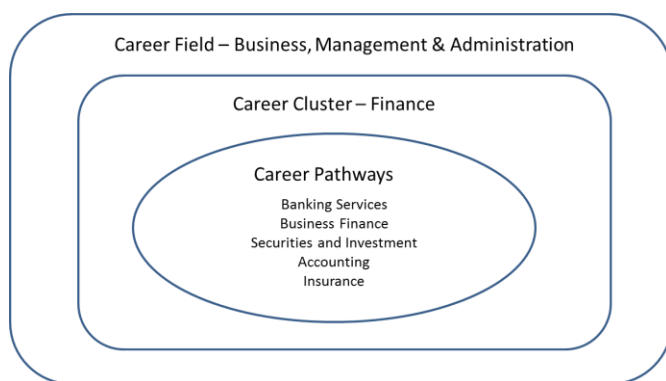
Figure 2.2. Example career pathway (adapted from Department of Education Minnesota, 2007).

In summary, career paths provide individuals with a clear roadmap for identifying a career that is appropriate to their career anchor preferences, career interests and abilities. Career fields are arranged around certain knowledge and skills and organised into a structure that comprises career clusters and pathways. The aim is to provide organisations, individuals and institutions of learning with a structure for building career roadmaps and identifying core competencies and behaviours, while considering the jobs in the workplace to be linked to career pathways to promote person–career path congruence.

b. *Classification of Subject Matters (CESM) code*

In the South African context, the Category of Education Subject Matter (CESM) classifies academic subject areas into 20 higher education/academic field categories (Department of Higher Education and Training, 2013; Visser, 2015), such as architecture/built environment, law, life sciences, psychology, social sciences, and the like.

The following represents the CESM code classification system (Visser, 2015):

CODE CESM FIELD
CESM 01: Agriculture, Agricultural Operations and Related Sciences
CESM 02: Architecture and the Built Environment
CESM 03: Visual and Performing Arts
CESM 04: Business, Economics and Management Studies
CESM 05: Communication, Journalism and Related Studies
CESM 06: Computer and Information Sciences
CESM 07: Education
CESM 08: Engineering
CESM 09: Health Professions and Related Clinical Sciences
CESM 10: Family Ecology and Consumer Sciences
CESM 11: Languages, Linguistics and Literature
CESM 12: Law
CESM 13: Life Sciences
CESM 14: Physical Sciences
CESM 15: Mathematics and Statistics
CESM 16: Military Sciences
CESM 17: Philosophy, Religion and Theology
CESM 18: Psychology
CESM 19: Public Management and Services
CESM 20: Social Sciences

In the CESM classification system, each qualification comprises a major field of study and each academic course/subject is linked to a category (Visser, 2015). This system works in a similar fashion to the OFO (DHET, 2017). To assist with career guidance, nine Occupational Clusters, with associated Occupational Fields, are identified. The Occupational Clusters and Occupational Fields are determined based on a combination of interest, aptitude and associated field of study. Table 2.4 gives a typical example of an occupational cluster and related occupational field.

Table 2.4

Example of an Occupational Cluster and Related Occupational Field

Occupational cluster	Description
08	Processing related occupations
Associated occupational fields:	
0801	General production, processing and engineering related occupations
0802	Metal and precious metal production and processing related occupations
0803	Plastics, rubber, concrete, glass and stone production and processing related occupations
0804	Textile, apparel and furnishing production and processing related occupations
0805	Chemical, gas, food and beverages production and processing related occupations
0806	Wood fabrication, production and processing related occupations.
0807	Printing related occupations
0808	Demolition, extraction, mining, metallurgical and materials related occupations
0809	Miscellaneous production, fabrication, assembly and stationary plant operating related occupations

DHET (2013).

The CESM classification system provides a framework of educational specifications to guide career guidance applications in South Africa and against which an individual's career anchor preferences, career interests and abilities can be mapped for the purposes of person–career path congruence.

2.3.2.2 Models based on established research such as Holland's personality and occupational types theory

Holland's (1997) personality and occupational types theory has been largely incorporated into career information delivery systems such as the O*NET (O*NET Centre, 2007) system (McDaniel

& Snell, 1999) through its link to the US Dictionary of Occupational Titles, and the WWM (Prediger, 2002). O*NET represents an impressive effort to develop a systematic body of information on occupational characteristics (Handel, 2016). This model will be discussed in more detail in section 2.3.2.2 (i) in order to illustrate its relevance to career path congruence.

In terms of the O*NET model, various products are available on the market to support career guidance and counselling. One such instrument is the Occupational Interests Profile Plus (OIP+), a test developed for career guidance situations. The OIP+ is partially based on the pioneering work of John Holland in the area of general career themes, although it also includes personality characteristics, and assesses how well-suited individuals are to different environments. It provides career-relevant information for the respondent in four main areas: personal work needs, career interests, career search tips and suggestions for vocational exploration (Psytech International, 2012).

Another product based on the O*NET model is Texas CARES (Career Alternative Resource Evaluation System) which has a focus on providing career exploration and occupational information. Created by the Texas Workforce Commission, the site offers versions of the O*NET Work Importance Locator and the O*NET Interest Profiler, as well as Best Match, a skills transferability program that matches users to O*NET occupations based on their current skill set. Occupational information for the many features available on the site is supported by the O*NET database (http://www.texascaresonline.com/index.asp). In the context of this study, the relevance of skill sets relates to perceived abilities in the context of career path congruence. The WWM (Prediger, 2002) provides information on the assessment of work-relevant abilities, interests and values and how the WWM can be used to link them to (a) each other, (b) Holland's hexagon, (c) basic work tasks, (d) occupational groups, and (e) occupations (Prediger, 2002). The relevance of the WWM to career path congruence in the context of this study will be discussed in more detail in section 2.3.2.2 (ii).

a. The O*NET content model

The Occupational Information Network (O*NET) was developed to be the primary source of occupational information in the United States of America (Koys, 2013). According to Koys (2013), a comprehensive study by the US National Research Council conducted in 2010 confirmed the most common uses of the O*NET in job analysis and job descriptions in support of various HR systems (especially related to recruitment and selection). Koys (2013) states that additional uses

include assisting in job clustering (job families and career ladders), providing supplemental information for companies' own job analysis efforts, and helping with person–job matching (especially in career planning).

The O*NET (O*NET Centre, 2007) includes the content model, a skills-based structure that serves as a framework for organising the information describing the world of work presented in O*NET products and tools (Peterson, Mumford, Borman & Jeanneret, 2001). As part of the content model, Occupational Interest Profiles (OIPs) were developed based on Holland's (1997) interest-based classification of work environments. The OIPs provide an important link between the O*NET (O*NET Centre, 2007) and the interest-based assessments that are often used in career counselling and other applied settings. Although numerous structural studies have supported Holland's theory with measures of the RIASEC personality types and work environments, the fundamental question of the sufficiency of the RIASEC types and work environments in relation to all occupations in the US remains unanswered (Deng, Armstrong, & Rounds, 2007).

The O*NET content model provides a framework for identifying the most important types of information about work and integrates them into a theoretically and empirically sound system. The model was developed using research on job and organisational analysis and embodies a view that reflects the character of occupations (via job-oriented descriptors) and people (via worker-oriented descriptors). The content model also allows occupational information to be applied across jobs, sectors or industries (cross-occupational descriptors) and within occupations (occupation-specific descriptors). These descriptors are organised into six major domains, which enable the user to focus on areas of information that specify the key attributes and characteristics of workers and occupations (Cascio & Aguinas, 2011; O*NET Centre, 2007). The model remains a work in progress and may be further enhanced through continued research (Sackett & Laczo, 2003). According to Coetzee and Roythorne-Jacobs (2012), the O*NET is a major advancement in understanding the nature of work, in large part because its development recognised that jobs can be viewed on four levels – economic, organisational, occupational and individual.

In terms of the O*NET model (O*NET Centre, 2007), various career clusters are identified (such as Business, Management and Administration). Each cluster is linked to a particular industry, such as Finance and Insurance. To group the jobs associated to the career cluster in the context of the industry, the job family Business and Financial Operations is created. In this context, the

level of expertise required is contained in what O*NET calls the Job Zone. This information is used by individuals to explore an interest in the particular career cluster.

In its career classification, the O*NET model (2014) defines the elements as follows:

- *Career cluster* **–** occupations in the same field of work that require similar skills.
- *Industry* **–** broad groups of businesses or organisations with similar activities, products or services. Occupations are considered part of an industry based on their employment.
- *Job family* **–** groups of occupations based on work performed, skills, education, training and credentials.
- *Job zone* **–** occupations are grouped into one of five categories based on the levels of education, experience and training necessary to perform the occupation.

An example is presented in Figure 2.3 (adapted from the O*NET Centre, 2014).
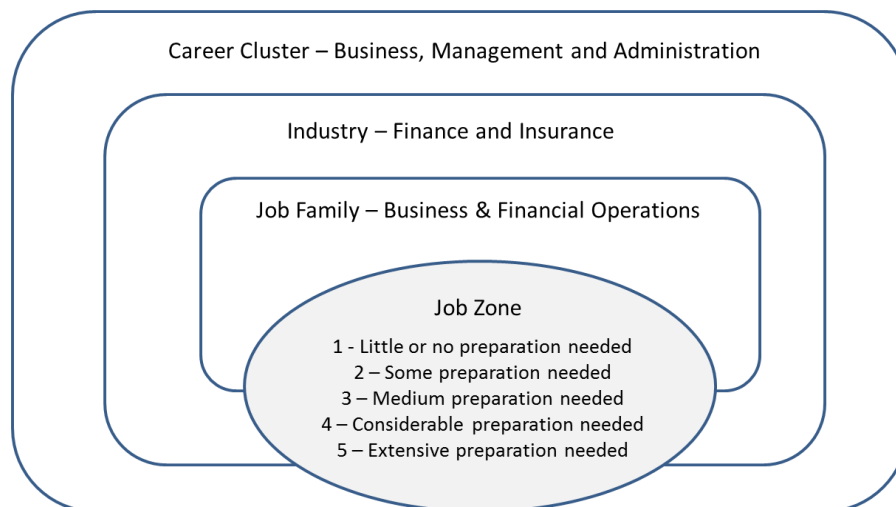
Figure 2.3. Example application of the O*NET Content model (adapted from O*NET Centre, 2014)

In summary, the O*NET was developed as the primary source of occupational information in the United States of America (Koys, 2013) and is based on Holland's (1997) personality and occupational types theory. The O*NET provides a framework that identifies the most important types of information about work and integrates them into a theoretically and empirically sound system. The O*NET content model was developed using research on job and organisational analysis and considers four aspects: it classifies jobs into career clusters (occupations in the same field of work that require similar skills), occupations are then considered part of an industry based

on their employment, with jobs being categorised into job families (groups of occupations based upon work performed, skills, education, training, and credentials) and job zones (occupations grouped into one of five categories based on the levels of education, experience and training necessary to perform the occupation) taking into consideration the level of preparation required to perform the job. This approach plays a significant role in providing a realistic career path framework to enable person–career path congruence by providing specifications against which to map an individual's career anchor preferences, career interests and abilities, and to attain congruence in terms of organisational career path modelling. Organisational career path modelling with be discussed in more detail in the context of models based on occupational or job clustering perspectives in section 2.3.2.3.

b. The World of Work Map

Like the O*NET model (2014), as discussed in section 2.3.2.2 (i), which uses Holland's (1997) hexagon as its core, careers have been clustered as part of the WWM (Prediger, 2002, p. 211) into 26 career areas (grouping of similar jobs) in 12 regions (clusters). The career areas and regions represent various combinations of data, ideas, people and things work tasks. Career areas are located on the WWM according to the relative standing of their member occupations on the Data/Ideas and People/Things work task dimensions (ACT, 2009).

Career area locations on the map are based on three sources of information: 1) expert ratings for all occupations in the US Department of Labor (DOL) O*NET database, 2) job analysis data for occupations in the DOL's Dictionary of Occupational Titles, and 3) Holland-type interest scores of people pursuing 640 occupations, as well as 4) the purpose of the work and the work setting (ACT, 2009).

In terms of relevance to this study, the WWM considers work-relevant abilities, interests and values as primary considerations when assisting individuals with career exploration and planning (Prediger, 2002). The WWM is illustrated in Figure 2.4.
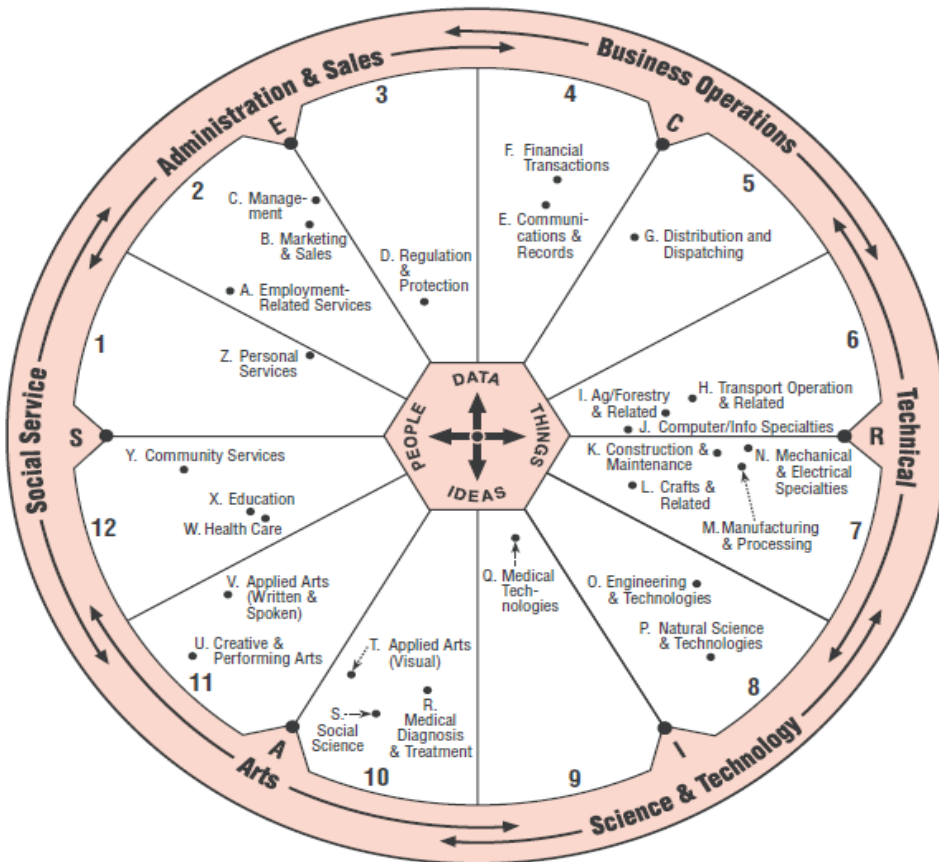
Figure 2.4. World of Work Map (Prediger, 2002, p. 211).

In summary, like the O*NET model, WWM is based on Holland's (1997) personality and occupational types, and occupations are categorised into career areas (or grouping of similar jobs) with a career area location based on the primary work tasks required, that is, working with data, ideas, things and people and listing occupations by career area and education level. Like the O*NET model, the approach followed by the WWM plays a significant role in providing a realistic career path framework to enable person–career path congruence by providing specifications against which to map an individual's career anchor preferences, career interests and abilities, and to attain congruence in terms of organisational career path modelling. Organisational career path modelling with be discussed in more detail in the context of models based on occupational or job clustering perspectives, with reference to section 2.3.2.3.

2.3.2.3 Models based on occupational or job clustering perspectives

Various industry research models have emerged in an attempt to provide a framework of occupational areas of jobs, which again informs career path construction. Within the South African legislative framework, the Organisation Framework for Occupations (OFO) (Department of Higher Education and Training, 2017) is deemed relevant to career path congruence in the South African context. In order to assist in career guidance, all Unit Groups were linked to the most appropriate Classification of Subject Matters (CESM) code (CESM, 2014). Related Unit Groups across and within the eight Major Groups of the OFO have also been linked. The CESM is a tool used by the South African DHET to collect information about qualifications and fields of study, the courses (or modules) offered within academic programmes, the courses for which each student is registered, and the fields in which academic/research staff members are active (CESM, 2014; Vorwerk, 2014). Both the CESM and OFO (as national occupational pathway) plays an important role in career guidance and counselling to enable person–organisation career path congruence. For the purpose of this study, the CESM and OFO are important for investigating career path congruence in the South African context.

    a. The Organising Framework for Occupations (OFO)

Like the O*NET occupational index (O*NET Centre, 2007) discussed in section 3.2.2 (i), the OFO is a coded occupational classification system applied by South African DHET, to identify, report and monitor skills demand and supply in the South African labour market (Department of Higher Education, 2013, and is an example of a skills-based approach to job analysis (Coetzee & Roythorne-Jacobs, 2012. According to Coetzee and Roythorne-Jacobs (2012), the OFO (Coetzee, 2013; DHET, 2017) provides an integrated framework for storing, organising and reporting occupation-specific information not only for statistical purposes but also for client-orientation applications, such as identifying and listing scarce and critical skills, matching job seekers to job vacancies, providing career information, and registering learnerships.

The purpose of the OFO is to establish a common language for talking about occupations. In terms of skills development, it enables a labour market dialogue for talking about skills demand and supply (DHET, 2013). Its purpose to provide a common language for talking about occupations and, thus, the OFO in this study is critical for investigating career path congruence in the South African context.

According to the Department of Labour (2013) and Coetzee (2013), the OFO is constructed by

- analysing jobs and identifying similarities in terms of tasks and skills
- categorising similar jobs into occupations, and
- classifying these occupations into occupational groups at increasing levels of generality.

The framework and concepts of the OFO are based on the International Standards Classification of Occupations (ISCO) and in particular version ISCO-08 (DHET, 2013). The ISCO and in particular ISCO-08 (International Labour Organization, 2012) present the structure and definition of all occupational groups, including correspondence tables between these groups and those previously published under the ISCO-88, which it supersedes. The ISCO-08 provides an updated and expanded index of occupational titles and associated codes (International Labour Organization, 2012) and has been developed to facilitate international comparison of occupational statistics and to serve as a model for countries developing or revising their national occupational classifications (International Labour Organization, 2012). According to the International Labour Organization (2012), the ISCO-08 is fully supported by the international community as an accepted standard for international labour statistics.

From a conceptual perspective, and in the context of this study, the following definitions outlined in the ISCO-88 are deemed important (International Labour Organization, 2012, p. 11):

- *Job* is defined as "a set of tasks or duties performed, or meant to be performed, by one person, including for an employer, or in self-employment".
- *Occupation* refers to the "kind of work performed in a job". The concept of occupation is defined as a "set of jobs whose main tasks and duties are characterized by a high degree of similarity". A person may be associated with an occupation through the main job currently held, a second job, a future job or a job previously held.
- *Skill* is defined as the ability to carry out the tasks and duties of a given job. For the purposes of ISCO-08 two dimensions of skill are used to arrange occupations into groups, namely *skill level*, defined as a function of the complexity and range of tasks and duties to be performed in an occupation; and *skills specialisation*, defined in terms of field of knowledge required, tools and machinery used, materials worked on or with, and the kinds or services or goods produced.

Within each major group, occupations are arranged into unit groups, minor groups and sub-major groups (International Labour Organization, 2012). Table 2.5 provides an example of an occupation group classification in terms of the ISCO-08.

Table 2.5

Example of an occupation group classification (International Labour Organization, 2012, p. 17).

Major Group	Services and Sales Workers
Sub-major Group	Personal Services Workers
Minor Group	Travel Attendants, Conductors and Guides
Unit Groups	Travel Attendants and Travel Stewards Transport Conductors Travel Guides

As summarised from the publication by the DHET (2013), the following concepts as depicted in Table 2.6 are important in terms of the OFO 2017, and relate to the purposes of this study for consideration in an integrated career guidance and counselling framework:

Table 2.6

Concepts Related to OFO 2011 and OFO 2012

CONCEPT	SUMMARY EXPLANATION
Job	A job is a set of tasks and duties carried out, or meant to be carried out, by one person for a particular employer including self-employment. Jobs in the workplace may either be related to occupations or specialisations on the OFO. The association depends on the level of uniqueness of the output of the job in the workplace.

Occupation	An occupation is a set of jobs whose main tasks and duties are characterised by a high degree of similarity (skill specialisation). The output of occupations clustered under the fourth level of the OFO (Unit Group) is described in terms of tasks and a descriptor. Occupations are thus related to the tasks defined at the Unit Group and an occupation descriptor describes what the application of the variety of tasks ultimately produces or delivers in the world of work. An occupation descriptor always indicates either the unique service the occupation renders or the unique product the occupation produces in executing some or all of the related tasks in a specific context.
Skill	Skill is defined as the ability to carry out the tasks and duties of a given job. Two dimensions of skill are used to arrange occupations into groups: skill level and skill specialisation.
Skill level	Skill level is defined as a function of the complexity and range of tasks and duties to be performed in an occupation. Skill level is measured operationally by considering one or more of the following: - the nature of the work performed (i.e. the complexity and range of work) in an occupation in relation to the characteristic tasks and duties defined - the level of formal education defined in terms of the International Standard Classification of Education (International Labour Organization, 2012) required for competent performance of the tasks and duties involved, and - the amount of informal on-the-job training and/or previous experience in a related occupation required for competent performance of these tasks and duties.

105

Skills specialisation	Skill specialisation is considered in terms of four conceptual concepts: - the field of knowledge required - the tools and machinery used - the materials worked on or with, and - the kinds of goods and services produced.
Structure	Occupations are grouped into Major (one digit), Sub Major (two digits), Minor (three digits), and Unit (four digits) groupings. The structure of the OFO differs slightly from the structure of ISCO – 08 in that it has only eight Major Groups instead of ten. (The ISCO – 08 Major Group 6: Skilled Agricultural, Forestry, Fishery Workers and Major Group 7: Craft and Related Trades Workers were combined. Major Group 0: Armed Forces were incorporated into the structure by adding one additional Minor Group and seven Unit Groups.) The Major Groups are primarily based on four skill levels; however, in Major Group 1 (Managers) the concept of skill level is applied primarily at the second hierarchical level (i.e. Sub Major Group). All Major Groups therefore relate to one skill level only except for Major Group 1, Managers that include occupations at ISCO-08 skill levels 3 and 4, at Sub Major Group level of the classification. The eight Major Groups are: 1 Managers 2 Professionals 3 Technicians and Associate Professionals 4 Clerical Support Workers

	5 Service and Sales Workers
	6 Skilled Agricultural, Forestry, Fishery, Craft and Related Trades Workers
	7 Plant and Machine Operators and Assemblers
	8 Elementary Occupation
	Occupational descriptors are provided for every occupational grouping, including occupations (6th digit level). A list of the associated tasks is also provided for every occupational grouping (up to 4th digit level).

Department of Higher Education and Training (2012)

Tables 2.7 and 2.8 present examples of the OFO classification.

Table 2.7

Example of an Occupation Group Classification.

Grouping	OFO Code	Description
Major Group	2015-1	Managers
Sub-Major Group	2015-12	Administrative and Commercial Managers
Minor Group	2015-121	Business Services and Administration Managers
Unit Groups	2015-1211	Finance Managers
Occupations	2015-12110	Credit Manager
Descriptor relevant to Credit Manager occupation.	2015-12110	Plans, organises, directs, controls, and coordinates the credit allocation, billing and settlement plan of client.

Organisational Framework of Occupations (DHET, 2015)

Table 2.8

Example of an Occupation Group Classification

Grouping	OFO Code	Description
Major Group	2015-7	Plant and machine operators and assemblers
Sub-Major Group	2015-71	Stationary Plant and Machine Operators
Minor Group	2015-712	Metal Processing and Finishing Plant Operators
Unit Groups	2015-7121	Metal Processing Plant Operators
Occupations	2015-71210	Metal Manufacturing Machine Setter and Minder
Descriptor relevant to Metal Manufacturing Machine Setter and Minder occupation.	2015-71210	Prepares, sets up and runs and monitors metal manufacturing machinery and equipment to produce metals.

Organisational Framework of Occupations (DHET, 2015)

An example of how useful the OFO is comes from a Human Sciences Research Council (HSRC) analysis of skills demand as reflected in newspaper advertisements over a three-year period (Coetzee & Roythorne-Jacobs, 2010). Three national newspapers were analysed, and 125 000 job advertisements found, advertising 28 000 unique job titles. Using the OFO, the HSRC could isolate 1200 unique occupations from the 28 000 job titles and 125 000 advertisements.

In summary, the framework and concepts of the OFO are based on the ISCO and, in particular, version ISCO-08 (DHET, 2013). The OFO is a method that is applied to analyse jobs and identify similarities in terms of tasks and skills, subsequently categorising similar jobs into occupations and classifying these occupations into occupational groups at increasing levels of generality. The OFO in alignment with ISCO-08 categorises occupations into major groups of occupations are then arranged into unit groups, minor groups and sub-major groups. Occupational descriptors are provided for every occupational grouping, including occupations, as is a list of the associated tasks. In South Africa, all jobs must be classified in terms of the groupings of the OFO to inform recruitment and selection, development and career planning. The OFO provides a framework of occupational specifications to guide job profile applications in South Africa and against which an

individual's career anchor preferences, career interests and abilities can be mapped for the purposes of person–career path congruence.

Mapping the CESM to the OFO is no easy task. Vorwerk (2014) concluded that a total of 102 of the 239 second-order CESM categories could not be linked to OFO unit groups. Advantages of the mapping benefits is greater alignment between education provision and labour marked demands, and a common framework encapsulating formal learning and workplace skills development (Vorwerk, 2014). Vorwerk (2014) concluded that only occupations and unit groups from major groups 1, 2 and 3, that is, Managers, Professionals, and Technicians and Associate Professionals, should be used for mapping links. In addition, because the unit of analyses of the CESM and the OFO are inherently different, there is a need for a mapping process to deal with, among others, occupations that do not necessarily depend on a singular technical or professional subject, as there is often more than one route to becoming an occupational practitioner (Vorwerk, 2014). As such, there is no clear one-to-one relationship between academic higher education subjects and occupations, as certain subjects provide career options, and occupations may require combination of subjects.

Table 2.9 presents key insights gained into the constructs and applications of the various models in relation to career path congruence.

Table 2.9

Core Insights and Application of Models

Core model	Key insights	Application in career path congruence
Models based on academic principles		
Department of Education of Minnesota (2007) career fields and clusters	Career fields linked to knowledge and skills. Occupations grouped into pathways to facilitate the construction of academic programmes. Knowledge and skills validated by industry from which academic programmes and programmes of study are developed.	Provides insight into academic career pathways in the context of occupational groupings.
South African Classification of Subject Matters (CESM) (DHET, 2013; Visser, 2015)	Academic subject areas are classified into higher education/academic field categories. Each qualification has a major field of study, and each academic course/subject is linked to a category. Occupational clusters are associated with occupational fields. Occupational clusters and occupational fields are determined based on a combination of interest, aptitude and associated field of study.	Provides insight into academic qualification/study field relevant to occupational groupings in the South African context.
Models based on established research models such as Holland's (1997) personality and occupational types theory		
The O*NET Content Model (O*NET Centre, 2007).	Skills-based structure that serves as a framework for organising information describing the world of work. Occupations relates to RIASEC – question remains whether all occupations are covered. Model was developed using research on job and organisational analysis. Reflects the character of occupations (job-oriented descriptors) and people (worker-oriented descriptors). Describes key attributes and characteristics of workers and occupations. The model defines elements such as career cluster, industry, job family and job zone (job profile based on level of education, experience, and training necessary to perform the occupation).	Primary source of occupational information in the USA. Most common uses of O*NET in job analysis and job descriptions in support of various HR systems (US National Research Council, 2010). Additional uses include assisting in job clustering (job families and career ladders), providing supplemental information for companies' own job analysis efforts, helping with person–job matching. Various products developed to assist organisations (e.g. Pathway Builder, a division of Profiles International Educational Services Division, provides participants with an interactive, comprehensive, online experience to plan and monitor their progress from high school through postsecondary education and into the workforce). Cengage Learning has developed a product called Career Transitions that uses the O*NET Interest Profiler and the O*NET database to help job seekers).

		O*NET model is a major advancement in understanding the nature of work, largely because its development recognises that jobs can be viewed from an economic, organisational, occupational and individual level.
ACT World of Work Map (WWM) (Prediger, 2002).	Uses Holland's (1997) hexagon as core. Cluster careers form part of the WWM. Career locations on the map are based on the following three sources of information: - Occupations listed on the US Department of Labour (O*NET) database. - Job analysis for all jobs listed on the US Department of Labour (O*NET) database. - Holland's (1997) type interest scores of people pursuing 640 occupations. Purpose of work and work setting.	The WWM considers work-relevant abilities, interests and values as primary considerations when assisting individuals with career exploration and planning.
Models based on occupational or job clustering perspectives		
South African Organising Framework of Occupations (OFO) (DHET, 2013).	Skills based approach to job analysis. Integrated framework for storing, organising and reporting occupation-specific information for - statistical reasons - client-orientation applications - identifying, listing scarce and critical skills - matching job seekers to job vacancies - providing career information - registering learnerships. Constructed by - analysing jobs and identifying similarities in terms of tasks and skills - categorising similar jobs into occupations and classifying these occupations into occupational groups at increasing levels of generality. Framework based on ISCO (International Standards Classification of Occupations) The OFO deems the following elements as important: - job - occupation - skill - skill level - skills specialisation. Each major occupational group comprises occupations arranged into sub-major groups, minor groups, and unit groups. Example: Group: Services and Sales Workers Sub-major group: Personal Services Workers Minor group: Travel attendants; conductors and guides. Unit groups: Travel attendants and travel stewards; transport conductors; travel guides.	The OFO is a coded classification system applied by the South African Department of Higher Education and Training (DHET) to identify, report and monitor skills demand and supply in the SA labour market. Providing a framework of occupations in the labour market, against which career ladders can be built. Purpose to establish a common language for talking about occupations. Enables labour market dialogue for talking about skills demand and supply.

111

2.4 CHALLENGES FACING CAREER PATH MODELLING WITHIN ORGANISATIONS

This section explores and discussed challenges facing organisations in defining and implementing organisational career pathways.

QBIT (2010) proposes the following challenges that are faced when facilitating career path modelling within the context of an integrated human resources (HR) solution:

- Is an attraction and retention strategy in place for critical roles and skill groups using information from the business and the application of current HR processes such as focused reward, benefit, pay, incentive options or development and career advancement strategies that will improve the ability to manage related risks? (QBIT, 2010).
- Has an HR scorecard for tracking business-relevant deliveries been set up? Is this HR scorecard reflected in the performance management contracts of staff, line managers and the HR function and does it make provision for career advancement activities such as crucial career development conversations, coaching and mentoring? (Adapted from QBIT, 2010).
- Do critical roles/positions and a list of critical skill set and/or competencies exist for the business? (QBIT, 2010).
- Do career paths exist for all critical roles in the business? This is a preferred set of role experiences that will allow the incumbent(s) to grow as they progress along the career path towards filling the critical role. The career path should reflect only those roles which form part of the generic role library designed through the core practices. A career path can include horizontal moves through the hierarchy. Level jumps should be avoided. People for whom career paths exist are normally rated high on the talent grid (QBIT, 2010).

In summary, career paths may not exist in organisations as part of standard human resource management practice and may not be consistently aligned to occupational classification models such as the OFO. Very often, organisations do not identify critical people capability areas to support business strategy, and where such capability areas exist, they may not be integrated into job profiles in an adequate and appropriate manner that is conducive to person–career path alignment. While this study will focus on career path alignment, it will not focus on job-specific alignment and this represents a limitation of the study.

2.4.1 Business case studies related to career path modelling

In this section, two application models will be discussed to illustrate organisational approaches to career path modelling. The purpose will be to gain insight into the application of career pathing to promote person–organisation career path congruence.

2.4.1.1 PepsiCola career growth model

The PepsiCo career growth model is a foundational model that describes how PepsiCo approaches career path building. The model describes career path building within the context of managing talent across the organisation (Church & Waclawski, 2010).

The model describes five critical components for developing and managing talent across the organisation (Church & Waclawski, 2010):

- *Proven results,* referring to both delivering business results and people results, which are weighed equally.
- *Leadership capability,* reflecting the competencies and behaviours that employees are expected to demonstrate.
- *Functional excellence,* describing the basic building blocks of knowledge for any given role.
- *Knowing the business cold,* meaning having a deep understanding of the various PepsiCo business models and go-to-market capabilities.
- *Critical experiences* represent a belief in providing individuals with the right set of experiences to promote talent development.
- Finally, *opportunities* in the model are reflected as a target, suggesting that not everyone can reach the centre of the target with any given assignment.

In the context of PepsiCo's talent management model, implementing the above model comprises three phases (Church & Waclawski, 2010):

- *Identify.* This refers to the process through which individuals are identified as having additional potential to take on more senior roles in the organisation.
- *Develop readiness.* This is based on the understanding that 70 percent of development occurs on the job or in the current role; 20 percent comes from coaching, feedback and mentoring;

and ten percent is derived from formal training. The combination of all three methods results in extensive career development planning as a means for accelerating high potential leaders.

- *Movement.* This refers to the process of moving high potential individuals in a proactive and planned manner – the objective here is that over time and through successive movement of high-potential talent the process allows the organisation to build a talent bench for the future.

Lessons learnt from the model application include the following (Church & Waclawski 2010):

- Having clear lines of ownership in any talent management process is critical.
- Do not assume that changing the definition of high potential in a tool will immediately result in enhanced talent calls.
- Related to this, not every leader or manager is equally gifted in the ability to think strategically about the future.
- While some people are adept at spotting potential based on whatever definition they are using, others get caught in what is called the 'performance-appraisal paradox'.
- Forced ranking should not be formally applied to talent management.
- Final learning in this area is less about talent management and more about how these processes, particularly the definition of high potential, can either support or conflict with organisational values or culture.
- Talent management and development is a complex process that requires a number of conditions to ensure success – it is critical to have a common set of tools and processes that drives consistency in language and execution.

In summary, the PepsiCola Career Growth Model considers the following components for developing and managing leadership talent across the organisation: proven results, leadership capability, functional excellence, deep understanding of the business, critical experiences, and targeted opportunities for career progression. Among others, the lessons learnt include the fact that not every leader or manager is equally gifted in the ability to think strategically about the future, not all managers are adept at spotting potential, and it is critical to have a common set of tools and processes that drives consistency in language and execution. Guided by the models discussed such as O*NET, WWM and OFO, it becomes difficult to ascertain the success of the case study in the absence of clearly defined data provided on criteria such as the primary work tasks required, that is, working with data, ideas, things and people, and clearly defined job profiles

within the context of industry and career path grouping, without which it is difficult to facilitate person–career path congruence.

2.4.1.2 Career models at Microsoft: CareerCompass

Microsoft has built a talent management framework and online system to support talent management and career development across the company (Yost, 2010). According to Yost (2010), the framework includes career models for 15 professions, covering all positions in the company. It was built in partnership with leadership teams in each of the professions to identify the characteristics that differentiate the best from average employees based on the results they deliver (Yost, 2010).

According to Yost (2010), *career development dimensions* include the following:

- *Competencies.* Each competency is defined across four behaviourally defined proficiency levels. These may include building organisational capability, cross-boundary collaboration, impact and influence, and developing senior leaders.
- *Experiences.* Employees report the level of exposure they have had on each of the key experiences (limited, moderate, deep) for their current and past job assignments. Examples include start-up business experience, turnaround business experience, technical role and global role.
- *Success inhibitors.* Leaders are rated by their managers against each of the success inhibitors on a three-point scale (not characteristic, somewhat characteristic, or characteristic). Examples include lacking a track record of results, failing to learn and grow, and not an attractor of talent.
- *Career stage results.* Employees rate themselves and are rated by their managers on each result area. These are defined by career stage with each dimension rated on a three-point scale (developing, full, or exceptional). Examples include business results, management results, leadership results, customer/ partner results, and integration.

The performance management dimensions are as follows (Yost, 2010):

- *Commitment ratings.* Each employee writes five to seven commitments for the year, including an execution plan and accountability measures for each. These are rated against a three-point scale (underperformed, achieved, exceeded).
- *Contribution rankings.* This entails the assessment of the future contribution of the employee to the company, measured on a three-point scale (lowest 10%, middle 70%, upper 20%).

Lessons learnt are as follows (Yost, 2010):

- Talent management at Microsoft was designed from a systems perspective, linking vertically to the business strategy and horizontally across the talent management systems to ensure that they complement and reinforce each other. CareerCompass, both the career models and the online system, has proven to be an important underlying framework for driving this integration.
- The importance of scalability – considerable time was spent developing processes and systems that could be generalised and scaled across professions.
- A final design feature that has proven valuable is to link the talent management processes directly to experience-based development. Mid-year career discussions emphasise on-the-job assignments as the best place to learn.
- Transparency has been an increasing priority – at Microsoft employees and managers see each other's ratings, leading to much more robust decisions.
- Another lesson that has emerged is the importance of simple yet elegant solutions – the systems are received best when they are simple and easy to use.
- Talent management is hard work – it is not always glamorous, it requires continuous effort, and it is an evolutionary journey.

In summary, the Microsoft career model CareerCompass differentiates between career development dimensions and performance management dimensions as part of talent management initiatives. In terms of career development dimensions, the following were included: competencies are clearly defined, employees report the level of exposure they have had on each of the key experiences (limited, moderate, deep) for their current and past job assignments, success inhibitors are identified, and rated, for each leader, and employees rate themselves and are rated by their managers on each result area. In terms of the performance management dimensions the following apply: commitment ratings (each employee writes five to seven

commitments for the year, including an execution plan and accountability measures for each and is then rated on a predefined scale), and contribution ratings (entails the assessment of the employee's future contribution to the company on a predefined scale). Talent management at Microsoft is designed from a systems perspective, linking vertically to the business strategy and horizontally across the talent management systems to ensure they complement and reinforce each other. CareerCompass, both the career models and the online system, has proven to be an important underlying framework for driving this integration and promoting the notion of person–career path congruence. The approach followed by the current study is to carefully consider an individual's integrated career anchor preferences, career interests and abilities profile and to relate it to organisational and/or industry career path considerations (informed by models related to educational and industry requirements) in order to provide an integrated measure to assist career counsellors to match individuals to contemporary world of work career pathways, as well as to assist with exploring the alignment between organisational career pathways and such models.

2.5 EVALUATION AND SYNTHESIS

Career path articulation and certain guiding frameworks require the integration of the following to enable alignment between educational and industry models and theoretical models: models based on educational or academic principles, models based on established research models such as Holland's (1997) personality and occupational types theory, and models based on occupational or job clustering perspectives. Although much research confirms the importance of linking individual career anchor preferences, career interests and ability profiles to occupational frameworks, limited research exists on relating them to the organisational (actual work) environment. The only references in terms of career interest and abilities and its correlation to career and job-related requirements (excluding career anchor preferences) relate to the O*NET, OFO and ISCO frameworks. In the South African context, little or no evidence could be found on the link between career anchor preferences, career interests and ability profiles and the OFO. However, a link was established between the OFO and the ISCO with the latter representing a global job classification framework. The conclusion is reached though that in the case of the ISCO and OFO, the focus is work centric and they do not necessarily consider person-centric profiles to guide alignment in terms of P-E career path congruence.

Considering the case studies listed in this chapter, namely, the PepsiCola Career Growth Model and CareerCompass (Microsoft), it may be argued that in the case of PepsiCola a foundational

model was developed that describes how PepsiCo approaches career path building. In the case of Microsoft, solid attempts were made to create frameworks that include career models for various professions, covering all the positions in the company. However, it is not clear from these case studies how a link was established between company-specific career frameworks and established external frameworks such as or similar to those of O*NET and the WWM, as well as the educational models guiding occupational frameworks.

As illustrated in figure 2.5, the method applied was to analyse models such as the WWM, and O*NET Content framework, supplemented by research on career anchor preferences, career interests and abilities, to investigate how career anchor preferences, career interests and abilities are mapped in terms of WWM, O*NET and RIASEC, with due consideration of published research on contemporary job or career requirements. These models were applied as referencing frameworks to determine research respondents' most suitable future career path alternatives.

LITERATURE REVIEW:

- Research pertaining to the WWM, O*NET Centre and RIASEC
- Literature studies relate to an understanding of the contemporary world of work

QUANTITATIVE RESEARCH:

- Respondents complete the I-PIA-M (comprising of career anchor preferences, career interests and abilities)
- Derive an integrated view of the three (3) highest scores in terms of career anchor preferences, career interests and abilities.

Assess I-PIA-M in terms of reliability and validity

QULITATIVE RESEARCH:

- Respondents complete the I-PIA-M (comprising of career anchor preferences, career interests and abilities)
- Derive an integrated view of the three (3) highest scores in terms of career anchor preferences, career interests and abilities.
- Conduct the Career Construction interview to supplement/support the results of the I-PIA-M
- Verify I-PIA-M scores with IDEAS scores

THEORETICAL ALIGNMENT:

- Determine 3-letter code in terms of the RIASEC against the Dictionary of Occupational Titles
- Determine the interest and abilities mapping of the respondents' career anchor preferences, career interests and abilities profiles in terns of the World of Work Map requirements
- Determine the interest and abilities mapping of the respondents' career anchor preferences, career interests and abilities profiles in terms of the O*NET Centre Content Model requirements
- Determine the level of integration between the RIASEC, WWM and O*NET Content Model to predict same career or occupational field.

Administer the IDEAS Questionnaire to a case study of one respondent from the qualitative population to verify the results of the I-PIA-M against the theoretical alignment outcomes for the respondent.

Figure 2.5. Method of analysis: Theory and world of work relevance to person-organisation career path congruence

2.6 CHAPTER SUMMARY

The achievement of research aim 2 of the literature review (to critically evaluate the implications of integrated career anchor preferences, career interests and abilities for organisational career development guidance practices) requires an understanding of the theory pertaining to the changing nature of careers, a review of the major theories in the career development and career management domain, and an exploration of the challenges faced by organisations in applying career path modelling within an organisational context. For the purposes of this research, the focus of the study was to explore an integrative framework for guiding career counselling practice aimed at enhancing person-organisation career path congruence.

In contextualising the contemporary world of work in the 21st century, various related concepts need to be explored. Accordingly, theory related to multidirectional career paths was explored, and the need for a paradigm shift to take place so that individuals are able to manage their careers in the contemporary work environment was highlighted. This was done against the background of P–E theories, and the impact they have on career pathways and career modelling within organisations. Various related factors impacting on careers such as employability, the knowledge economy and human social capital were discussed. Major theories that influence person–career path congruence were discussed. These include trait and factor/ person–environment fit theories, person-in-environment perspectives, system theory and career construction and life design.

In the context of this research, organisational career path offerings were explored in the context of career pathways, as proposed by various theoretical and industry frameworks. From an organisational perspective, it is critical to understand the concept of career path modelling to promote alignment between individual and organisational career path congruence. As such, these concepts were explored, defined and investigated in the context of career path models based on educational or academic principles, models based on established research models such as Holland's (1997) theory, and models based on occupational or job clustering perspectives.

In addition, the chapter explored and discussed challenges facing organisations in defining and implementing organisational career pathways, supported by published business case studies to illustrate contemporary organisational approaches to career path modelling.

The next chapter provides insight into the factors underlying integrated career path congruence, namely, career anchor preferences, career interests and ability, as well as their effect on individual

choices related to career fields and sub-fields through the application of an integrated instrument for career counselling and guidance to assist career counsellors within an organisational and/or work context.

CHAPTER 3

CAREER ANCHOR PREFERENCES, CAREER INTERESTS AND ABILITIES IN THE CONTEXT OF PERSON–ENVIRONMENT CONGRUENCE

Chapter 2 discussed the theory pertaining to the changing nature of careers, reviewed the major theories in the career development and career management domain and investigated evolving research frameworks based on these theories. Challenges facing career path modelling within the organisational context were also explored. Chapter 3 aims to provide insight into concepts that have a direct impact on career satisfaction and P–E fit. In the context of this study, the focus will be on the effect that career interests and self-perceived abilities may have on an integrated perspective on person–organisation career path congruence, and the influence of career anchor preferences to support the notion of person–career path congruence. To create context in terms of the role of career anchor preferences, career interests and self-perceived abilities in person-career path congruence, these concepts and the relevant theoretical models will now be discussed.

Core themes to be discussed in this chapter are summarised as follows:
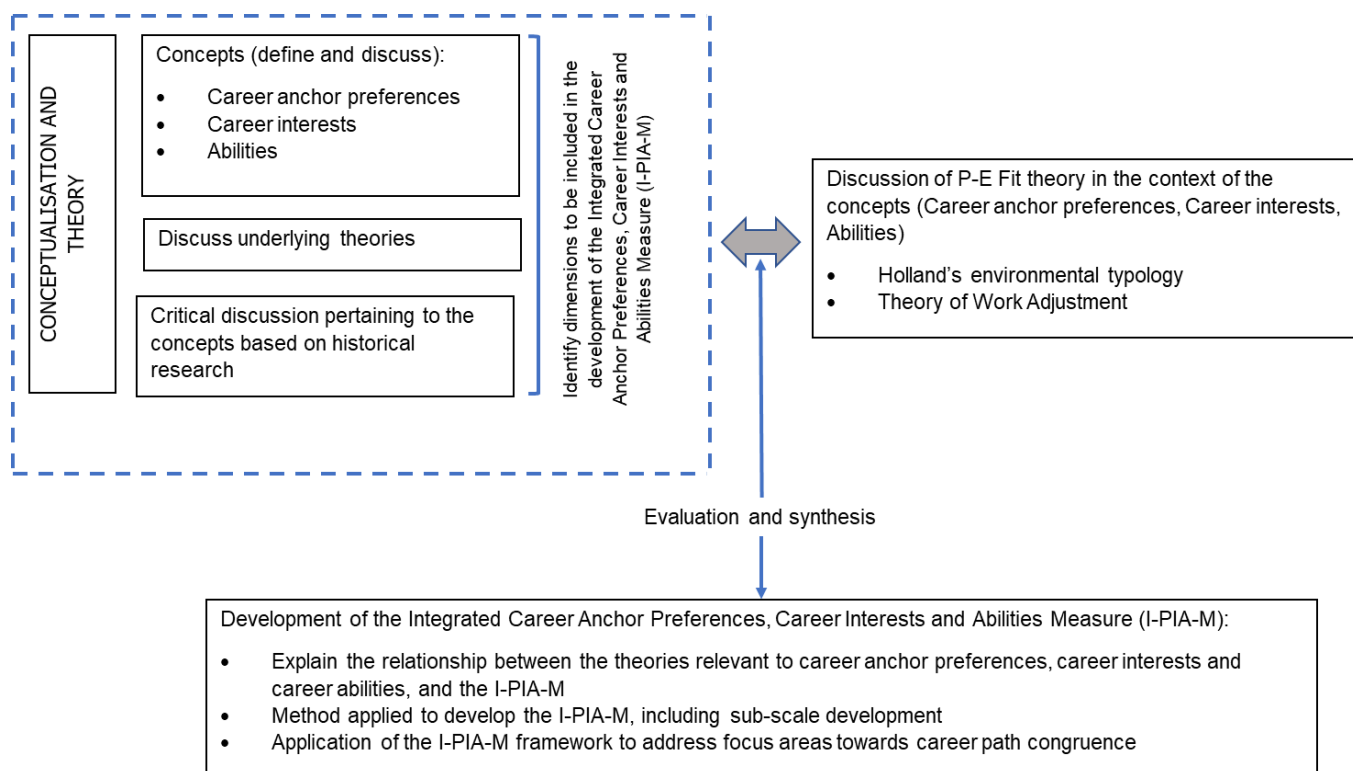
Figure 3.1. Overview of chapter core themes.

3.1 CAREER ANCHOR PREFERENCES

All P–E fit theories share the following assumptions (Su et al., 2015): People seek out and create environments that allow them to manifest their traits behaviourally (e.g. dominant individuals seek leadership positions); the extent to which people fit their work environments has significant consequences (e.g. satisfaction, performance, stress, productivity, turnover), with better fit being associated with better outcomes; and P–E fit is a reciprocal and ongoing process whereby people shape their environments and environments shape people (Rounds & Tracey, 1990). Career anchor preferences (Schein, 1978; 1990; 2006) represent an important factor in P–E fit, as individuals will aim to align most effectively with work environments that correspond with their career anchor (Schein, 1990; 1996).

3.1.1   Conceptualisation

The concept of career anchor was first introduced by Schein (1978) to describe the association between self-perceived attitudes, values, needs and talents that individuals develop over time (Peterson & Roger, 2009). A career anchor may be defined as "a combination of perceived areas of competence, motives, and values that you would not give up; it represents your real self" (Schein, 1990, p. 1). According to Schein (1990), regardless of one's current job or career, future decisions will be easier and more valid if there is a clear understanding of one's own preferred orientation towards work, motives, values and self-perceived talents. Schein's (1990) Career Orientations Inventory (COI) is considered in the current study owing to the importance of career anchor preferences (i.e. most preferred career orientations as measured by the COI as a subscale of the I-PIA-M) in career decision-making processes and perceptions of career path congruence.

3.1.2   Theory

Schein (1990) identifies eight career anchors: technical/functional competence, general managerial competence, autonomy/independence, security/stability, entrepreneurial/creativity, service/dedication to a cause, pure challenge, and lifestyle.

The profiles of Schein (1990) eight career anchors can be summarised as follows:

- *Technical/functional competence* – primarily excited by the content of the work itself; prefers advancement only in his/her technical or functional area of competence; generally disregards and fears general management as being too political.

122

- *General managerial competence* – primarily excited by the opportunity to analyse and solve problems under conditions of incomplete information and uncertainty; likes harnessing people together to achieve common goals; stimulated (rather than exhausted) by crisis situations.
- *Autonomy/independence* – primarily motivated to seek work situations that are maximally free of organisational constraints; wants to set own schedule and own pace of work; is willing to trade off opportunities for promotion in order to have more freedom.
- *Security/stability* – primarily motivated by job security and long-term attachment to one organisation; willing to conform and to be fully socialised into an organisation's values and norms; tends to dislike travel and relocation.
- *Entrepreneurial/creativity* – primarily motivated by the need to build or create something that is entirely their own project; easily bored and likes to move from project to project; more interested in initiating new enterprises than in managing established ones.
- *Service/dedication to a cause* – primarily motivated to improving the world in some fashion; wants to align work activities with personal values related to helping society; more concerned with finding jobs which meet their values than their skills.
- *Pure challenge* – primarily motivated to overcome major obstacles, solve almost unsolvable problems, or win out over extremely tough opponents; define their careers in terms of daily combat or competition in which winning is everything; very single-minded and intolerant of those who lack comparable aspirations.
- *Lifestyle* – primarily motivated to balance career with lifestyle; highly concerned with such issues as paternity/maternity leave, day-care options, and the like; looks for organisations that have strong pro-family values and programmes.

Schein (1996) maintained that motivated employees are crucial to an organisation's success, and therefore understanding people in their jobs and what motivates them could be a driving force in strengthening organisational commitment. A recent study conducted by Bezuidenhout et al. (2013) focused on an understanding of the fit of individuals' internal career needs (aspirations) in their jobs based on Schein's career anchors. The study (Bezuidenhout et al., 2013) concluded that career paths may be structured and mapped using Schein's career anchors in a constructive succession plan at the highest levels of the organisation, with due consideration of the role played by demographic variables (age, gender and race groups) in regard to career anchor preferences in the short and medium term, the significant differences between career anchor preferences in the short and medium term, and whether the change has dynamic or stable characteristics, and

whether dominant and/or secondary career anchor preferences exist for employees within the organisation.

3.1.3 Research on career anchor preferences

In investigating the progression from career anchors to preferred career orientation, Rodrigues, Guest, and Budjanovcanin (2013) listed two limitations regarding the concept of career anchors. Firstly, career anchors are grounded in an individualistic perspective of careers that emphasises agency over structure. Secondly, given the connotations of stability and immovability associated with career anchors, this would seem to be in contrast to the concept of contemporary careers, which are depicted as physically and psychologically boundaryless. Even though individual identity is certainly relevant in the shaping of career anchor preferences, it can be argued that the role of social and family relations and institutional pressures are insufficiently considered in Schein's theory (Rodrigues et al., 2013). It can also be argued that individuals are expected to move through frequent career cycles to promote continuous learning and employability rather than achieving and seeking to prolong the maintenance stage of their careers (Rodrigues et al., 2013). In addition, Rodrigues et al. (2013) argue that the anchor metaphor, underpinned by the needs, values and abilities developed in the first five to ten years of work, shapes the remainder of an individual's career and therefore does not seem to reflect the nature of contemporary careers. It is therefore proposed that the term 'anchor' be replaced with preferred 'orientation'. Rodrigues et al. (2013, p. 143) define 'orientation' as "relatively stable career anchor preferences emerging inter alia from the interaction between self-identity, family relationships, social and cultural background, education, work experiences and labour market conditions".

A study conducted by Danziger et al. (2008) reported on the construct validity of the measurement model of Schein's career orientation inventory (COI), where entrepreneurship and creativity constitute two separate constructs. The study comprised a fairly representative sample of 1847 Israeli working adults who completed Schein's COI questionnaire. Danziger et al. (2008) subsequently found support for Schein's career anchor theory apart from the fact that a more effective distinction between creativity and entrepreneurship was created (resulting in a nine instead of an eight-factor proposition). It was found that the conceptual framework for differentiating between nine and not eight anchors would make the COI a more valid and reliable instrument, both for theory-building and for practical and diagnostic use by career counsellors (Danziger et al., 2008). Some researchers have raised the possibility that there might be anchors which are not included in the COI. For example, Baruch (2004) suggests additional anchors for

the 21st century, such as employability and spiritual purpose, while Suutari and Taka (2004) suggest the addition of an Internationalism anchor, which may characterise internationally oriented managers. According to Danziger et al. (2008), this direction should be explored by future studies.

Bravo et al. (2017) investigated the feasibility of developing a measure that is grounded in the career anchor framework but better reflects the boundaryless nature of modern-day careers. This study (Bravo et al., 2017) is important for the purposes of this study since it is imperative for organisations to better understand the career drivers and motives of their employees for talent retention and development purposes. This notion is in alignment with the two dimensions of the protean career, as stated by Briscoe et al. (2006), thus inferring that careers are driven by individuals' internal values and self-directedness. As such, Bravo et al. (2017, p. 503) define career orientations as "the features of work that define one's career goals reflecting the individual's self-concept regarding his or her self-perceived values, interests, experiences, skills, and abilities". According to Bravo et al. (2017), Schein's (1978, 1990) model assumes that an individual will have a dominant preferred anchor and not multiple anchors. Questions raised by Bravo et al. (2017) include whether an individual can hold more than one anchor, and whether an individual's career anchors will remain stable over time.

Apart from these questions, considering that a number of anchors that may be salient to an individual at a given point in time, the career orientation construct of Bravo et al. (2017) is more in line with what previous scholars have suggested, and as such more reflective of current career perspectives. Feldman and Bolino (1996) argue that individuals can have multiple career anchors of differing intensity and that the significance of any one anchor may change over time as a result of new experiences and challenges. Bravo et al. (2017) believe that the impact of the possibility of changes in an individual's values and needs as a result of new career paths that are driven and managed by the individual and not the organisation has to be considered. Although the definition of career orientation shares conceptual similarities with the career anchor concept in terms of focusing on perceived skills, the needs important to one's career and one's internal values (Bravo et al., 2017) differ in terms of the multidimensional nature of the distinct orientations and the stability of orientations over time. Although not a new concept, Bravo et al. (2017) developed a career orientation scale presented as an updated valid scale that can extend the current career anchors framework to promote greater consistency in terms of modern-day boundaryless careers.

Gubler, Biemann, Tschopp, and Grote (2015) investigated whether career anchors differentiate career trajectories into different patterns and, if they do, whether different career anchors vary regarding their discriminative power. The research involved 77 Swiss managers over 15 years and found that the Managerial Competence (MC) and Lifestyle (LS) anchors in particular are strong differentiators (Gubler et al., 2015). Bubler et al. (2015) found that individuals with different preferences on these anchors had significantly different career trajectories and, as the results highlighted, the relationship between preferred career anchors and sociodemographic variables is complex and differs for various job characteristics, such as hierarchical level and company size.

In summary, Schein (1990) identifies eight career anchor preferences: technical/functional competence, general managerial competence, autonomy/independence, security/stability, entrepreneurial/creativity, service/dedication to a cause, pure challenge, and lifestyle. A vast amount of research has found a significant correlation between career anchors and the theory of vocational choice and adjustment (Holland, 1997). Studies investigating the indicated level of congruence of individuals' internal career needs (aspirations) in their jobs (Bezuidenhout et al., 2013) have found that career paths can be structured and mapped using Schein's career anchors. Criticism of Schein's (1990) career anchors relates to the fact that even though individual identity is certainly relevant in the shaping of career anchor preferences, it may be argued that the role of social and family relations and institutional pressures is insufficiently considered in Schein's theory (Rodrigues et al., 2013). However, for the purposes of this study, there is significant research supporting the importance of career anchors for person–career path congruence, and suggestions for possible additional anchors (Baruch, 2004; Danziger et al., 2008; Rachman-Mooretest, & Valency, 2008) may emerge.

3.1.4   Insights gained

For the purposes of this study, the following insights were gained by including career anchor preferences in this study:

- Career paths can be structured and mapped using Schein's theory of career anchor preferences in a constructive succession plan.
- As reported by Danziger et al. (2008), a more effective distinction between creativity and entrepreneurship exists, resulting in a nine-factor rather than an eight-factor proposition.
- Considering the 21st century world of work, the theory may expand to include additional anchor preferences such as those related to employability and spiritual purpose (Baruch,

2004) and an Internationalism anchor, which may characterise internationally oriented managers (Suutari & Taka, 2004).

- According to Danziger et al. (2008), additional anchor preferences should be explored by future studies. Accordingly, this research will consider the eight established anchors as proposed by Schein (1990) for exploring the effect of career anchor preferences on an integrated measure for career–path congruence.

- Depending on the fit between the research findings and the eight career anchor preferences (Schein, 1990), the results of the current research will strive to indicate the effect of the research findings on possible additional anchor preferences.

3.2 CAREER INTERESTS

This section will explore various approaches to career or vocational interests, with a particular focus on Holland's (1997) theory of personality and occupational types compared with TWA/P-E correspondence (person-job fit) (Dawis & Lofquist, 1993; Dawis, 1996; 2005).

3.2.1   Conceptualisation

Career interests reflect preferences for certain behaviours and activities, the context within which these preferred activities occur, and the outcomes associated with the preferred activities (Armstrong, Day, McVay, & Rounds, 2008). Interests provide an organisational framework for describing educational, work and leisure environments that may be used in career counselling and other applied settings (Armstrong et al., 2008).

Holland's (1997) theory of personality and occupational types plays a vital role in the career guidance process and it views career choice as a match between personality and the work environment (Schreuder & Coetzee, 2011). Holland (1997) uses a primary survey to distinguish between six personality types and six matching work environments, with each type characterised by career interests linked to particular workplace-related activities (Schreuder & Coetzee, 2011). These preferences and aversions influence the choice of work environment, while the environments are defined by typical work activities and other demands placed on individuals (Armstrong et al., 2008).

In a study conducted by Armstrong et al. (2008), Holland's (1997) interest types were proposed as a set of standard reference points for representing the structure of interest. According to

Armstrong et al. (2008), the effectiveness of interest-based measures for matching individuals and environments is evidenced by their longstanding use in career counselling and in other applied settings.

3.2.2 Theory

The aim with the discussion is to explore the influence of Holland's (1997) theory (personality and occupational types) compared with TWA/PE correspondence (person-job fit) (Dawis & Lofquist, 1993; Dawis, 1996; 2005) on person-organisation career path congruence.

3.2.2.1 Holland's personality and occupational types theory

As discussed in Chapter 2, Holland's (1997) theory classifies individuals, jobs and environments into six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC). In this way, work environments are assessed or described according to their degree of resemblance to the six environmental types (Gottfredson & Holland, 1996). Table 3.1 summarises the description and application of Holland's personality and occupational types.

According to Gottfredson and Holland (1996), individuals will seek out and remain in a workplace if it is characterised by congruence between individual career interests and the degree to which the workplace corresponds to these needs. Similarly, workplace environments will recruit, retain and reward people whose career needs are congruent with the needs of the workplace or organisation. Congruence refers to the degree to which the vocational personality of an individual matches the occupation or the organisational career path requirements (Gottfredson & Holland, 1996). According to Gottfredson and Holland (1996), all things being equal, individuals seek, are selected for and remain in occupations that roughly match their level of general ability to the level of complexity required by the work environment.

Table 3.1

Holland Personality and Occupational Types

Attribute	Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Career interest preferences for activities and occupations	Manipulation of machines, tools and things	Exploration, understanding and prediction or control of natural and social phenomena	Literary, musical, or artistic activities	Helping, teaching, treating, counselling, or serving others through personal interaction	Persuading, manipulating, or directing others	Establishing or maintaining orderly routines, application of standards
Values	Material rewards for tangible accomplishments	Development or acquisition of knowledge	Creative expression of ideas, emotions or sentiments	Fostering the welfare of others, social service	Material accomplishment and social status	Material or financial accomplishment and power in social, business, or political arenas
Requires	Manual and mechanical competencies, interaction with machines, tools, and objects	Analytical, technical, scientific and verbal competencies	Innovation or creative ability, emotionally expressive interaction with others	Interpersonal competencies, skill in mentoring, treating, healing,	Skills in persuasion and manipulation of others	Clerical skills, skills in meeting precise standards for performance

					or teaching others		
Environment demands and rewards the display of	Conforming behaviour, practical accomplishment	Scepticism and persistence in problem solving, documentation of new knowledge, understanding or solution of problems	Imagination in literary, artistic or musical accomplishment	Empathy, humanitarianism sociability, friendliness	Initiative in the pursuit of financial or material accomplishment; dominance; self-confidence	Organisational ability, conformity, dependability
Sample occupations	Carpenter, truck operator	Psychologist. microbiologist	Musician, interior designer	Counsellor, clergy member	Lawyer, retail store manager	Production editor, bookkeeper

Adapted from Gottfredson and Holland (1996, pp. 3–4)

In summary, for the purposes of this research, *career interests* will be defined in terms of Holland's (1997) theory of personality and occupational types focusing most explicitly on interests (Hansen, 2013; Nauta, 2013). According to Hansen (2013) and Nauta (2013), Holland's theory provides a comprehensive model of vocational interests and their relationship to career decision-making, satisfaction and performance. It also provides a framework for integrating higher-order abilities, personality, values, interests and needs, and for describing interests relative to people, work environments and job tasks (Hansen, 2013). Holland's (1997) theory uses a classification of individuals to describe and explain individual differences and similarities, and a classification of work environments to describe and explain differences and similarities among positions and occupations. The classification, labelled RIASEC, represents six theoretical personality types, namely Realistic, Investigative, Artistic, Social, Enterprising, and Conventional, and it is mapped back to occupational categories to determine person–work environment fit (Gottfredson & Holland, 1996).

3.2.2.2 Theory of TWA/P-E Correspondence

According to Caplan (1987), TWA/P–E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) is a method for understanding the process of adjustment between organisational members and their work environments. Caplan (1987) maintains that various needs exist to better understand adjustments in organisations, of which one is the need to assess the characteristics of the person and of the environment along commensurate dimensions. A second requirement is the importance of distinguishing between objective and subjective measures of fit and their components, making it possible to define accuracy of perception as a discrepancy between objective and subjective fit. A third requirement relates to the distinction between fit defined in terms of abilities versus environmental demands (Caplan, 1987). According to Kristof-Brown et al. (2005) and Yu (2016), demands refer to the objective (in which the employee's knowledge, skills and abilities are commensurate with what the job requires, e.g. project deadlines, quality standards) and socially constructed (e.g. role expectations, behavioural norms) requirements that are placed on a person. Abilities include the knowledge, skills, energy and other personal resources that the individual can draw upon to meet these demands. In addition, needs–supplies (N–S) fit is the second type of complementary fit and refers to the fit between individual needs and the ability of the environment to fulfil those needs (Yu, 2016).

As stated on chapter 1, the context of career intervention, P–E fit or congruence is essential for career planning, decision-making and adjustment (Su et al., 2015). According to Kristof-Brown et al. (2005) and Van Vianen (2018), there are five critical domains in P–E fit, namely, person-vocation fit, person–job fit, person–organisation fit, person–group fit, and person–supervisor fit. For the purposes of this study, the focus will be on person-vocation fit, person–job fit, and person–organisation fit.   People feel drawn to environments in which they can express their career interests and career anchor preferences (person-vocation fit, and person-environment fit: Van Vianen, 2018). The notion of person-organisation career path congruence is anchored in the three basic principles of person-environment fit theory: (1) fit is a more powerful predictor of individual outcomes such as job satisfaction than either the person or the environment alone; (2) individual outcomes are most optimal when personal attributes (i.e. needs/preferences, interests, abilities, and values) and environmental attributes (i.e. career areas/job types' demands and supplies) are compatible regardless of the level of these attributes; and (3) discrepancies (misfits/lack of congruence) between personal and environmental attributes reduce positive outcomes irrespective of the direction of the discrepancies (i.e. individuals with low, medium and high attributes may respond similarly negatively in the case of the environment/organisation offering less than the individual desires career-wise: Van Vianen, 2018).

Vocational choice is maximised by specifying important characteristics of both individual and environment in order to find the best match between them (Swanson & Schneider, 2013). When job characteristics are aligned with employees' personal interest needs and abilities, employees are most likely to experience good person–job fit (Kristof-Brown et al., 2005). Person–organisation fit addresses the compatibility between people and entire organisations (Kristof-Brown et al., 2005).

Holland's theory (personality and occupational types) compared with TWA/P-E correspondence (person-job fit) provides a framework within which to predict the outcomes of the match between the individual and the work environment (predictive model) and to describe the ongoing process of interaction (work adjustment) between them (Dawis & Lofquist, 1984; Eggerth, 2008). The concept of correspondence associated with the TWA refers to the match between worker needs and work environment reinforcers and can be used to predict job satisfaction (Dawis & Lofquist, 1984) and to predict the match between worker abilities and the behavioural requirements of a job. It introduces the concept of satisfaction in the context of an individual's satisfaction with his or her job, and the concept of satisfactoriness which refers to an individual with whom the work environment is satisfied (Eggerth, 2008; Swanson & Schneider, 2013). The TWA consists of two

models (Swanson & Schneider, 2013), namely, a predictive model (focusing on the variables that explain whether individuals are satisfied with their work environment, and whether they are satisfactory to their work environments) and an interaction model (focusing on how the fit between individuals and their environments is attained and maintained). The focus of this study is on the predictive model in the context of P–E fit, in particular the impact of correspondence, and how these inform the notion of person–career path congruence.

In TWA, employees and work environments are seen as having a reciprocal relationship that jointly affects tenure (i.e. length of employment). Occupations require employees to have certain abilities, and employees expect occupations to supply 'reinforcers' (rewards) that meet certain needs (the pattern of which reflects their work values) (Su et al., 2015). 'Correspondence' (or fit) between a job and a job holder is high when an employee meets or exceeds the abilities demanded by a job or a job meets or exceeds the needs of an employee (Su et al., 2015). Holland (1997) argues that congruence between an individual's personality and their occupational field of study determines professional satisfaction, diligence and success.

The TWA process model focuses on how adjustment occurs and how it is maintained (Swanson & Schneider, 2013). According to Swanson and Schneider (2013), adjustment style consists of four variables: flexibility (how much discorrespondence people will tolerate before a threshold of dissatisfaction is reached leading to adjustment behaviour); active adjustment (the individual acts on the environment in an effort to decrease discorrespondence such as trying to change the available rewards and/or trying to change what the environment requires); reactive adjustment (the individual taking it upon him or herself to reduce the amount of discorrespondence by, for example, changing his or her own needs and/or skills); and perseverance (the length of time an individual is willing to persist in a discorrespondent environment after engaging in adjustment behaviour). According to Swanson and Schneider (2013), adjustment styles are relevant to the environment as well, in the sense that environments differ in how much discorrespondence they will tolerate between an individual's abilities and the environment's ability requirements before judging the individual as unsatisfactory (flexibility). If an environment's flexibility threshold is exceeded, it will engage in either active or reactive styles. Active style in this context could include providing additional training to improve individual abilities or will be reactive by transferring the individual to a more ability-correspondent environment (Swanson & Schneider, 2013). In terms of perseverance, some environments may discontinue the services of the individual more quickly than others (Swanson & Schneider, 2013).

In this study, the term "congruence" is preferred to the classical term "fit" based on the premise that perfect fit seldom exists. People generally tend to make sub-optimal choices and both individuals and their career environments evolve and change over time (Van Vianen, 2018). Moreover, career development and decision making have become more complex and uncertain in today's volatile, rapidly changing world of work (Van Vianen, 2018; Vogel, Rodell, & Lynch, 2016). However, the development of an integrated career anchor preferences, career interests, and abilities measure for career path congruence counselling incorporates the basic principles of the following three classical person-environment (PE) fit theories (1) person-vocation fit (i.e. theory of personality and occupational types (Holland,1997) and Schein's (1990) career anchor preferences framework); (2) person-job fit (i.e. theory of work adjustment (TWA/P-E correspondence of Dawis, 1996, and Dawis & Lofquist, 1993); and (3) person-organisation fit (i.e. world of work map theory of occupational types and career paths (Prediger, 2002), and Holland's RIASEC categorisation of occupational categories). The chosen focus of the research constructs and theories built on the premise that P-E fit should be conceptualised and modelled as a formative construct (consider fit at a variety of dimensions and levels of the environment simultaneously). Various aspects of the person and the environment influence P-E fit, and that fit should be considered holistically in research and practice (Darrow & Behrend, 2017).

Career interests' definitions are based on various source input and occupational groupings and relevant published job data. The approach will be discussed in more detail under section 3.6.2 where interest items of the I-PIA-M will be discussed.

For the purposes of the present study, career interests will be explored (with due relevance to RIASEC as indicated below):

- *Activity driven (related to realistic (R))*– Physical activities are performed, often equipment and vehicles are operated/controlled, and complex/technical activities are accomplished as job outputs
- *Administrative and related services (related to conventional (C))*– Supporting business operations by delivering routine, complex and specialised administrative duties in accordance with predefined processes and procedures
- *Business and related careers (related to entrepreneurial (E))* – Business careers involve managing a business, project or production processes, and developing and implementing business processes and plans. Advertising, marketing and the sale of goods and/or services

to customers are included in this career field. It often involves managing, motivating and leading staff

- *Customer and support services (related to entrepreneurial (E) and social (S))* – Customer support involves helping customers efficiently, in a friendly manner. It is the act of taking care of the customer's needs by providing and delivering professional, helpful, high quality service and assistance before, during, and after the customer's requirements are met

- *Environment driven (related to artistic (A) and investigative (I))* – Work environment preferences include various factors. Such factors include the preference for outdoors (the need to work in the open air and typically will not pursue careers that requires office bound activities), indoors (the need to work within a building and typically will pursue careers involving office bound activities), formal (the need to work in high disciplined environments governed by rules and regulations and where high emphasis is placed on image, formal dress codes and ceremonies) or informal (the need to conduct daily activities in a more flexible and relaxed manner without jeopardizing quality of service and/or products).

- *Financial and numerical related services (related to entrepreneurial (E))*– People interested in a career involving finances/working with numbers, have the need to work with figures, making simple and complex calculations in solving problems of a various nature. Typically, they are well organized individuals with well-developed analytical and problem-solving skills and an eye for detail. In order to succeed in this field of work an above average ability in Mathematics is required

- *Information Technology (related to investigative (I) and realistic (R))*– People interested in a career involving Computers or Information technology, have the need to work with complex data in either raw or final format. Typically, they are well organized individuals with well-developed analytical and problem-solving skills.

- *Scientific orientation (related to investigative (I) and realistic (R))* - People interested in a career in the Sciences have an investigative mind, approaching matters and issues from a scientific perspective. They have the need to collect, collate data, analyse it, interpret and report on findings, providing others with their valuable conclusions. They tend to be well-organized, with well developed analytical and problem-solving skills and apply logical thinking in a more informal, yet procedure-controlled environment.

- *People oriented (related to social (S))* – Careers involve working with, communicating with, and teaching people. These occupations often involve helping or providing service to others.

The approach followed was to analyse job related information (such as published in Job File South Africa, Careers.co.za, 2006). Careers.co.za (2006) in partnership with VT Career Management and the South African Qualifications Authority (SAQA) conducted workplace research and compiled a catalogue of jobs against occupational groupings. This was a method similar to that of the ONET system based on Holland's (1997) personality and occupational theory. Interests statements were derived from the job catalogue and related to the career interests identified against the RIASEC framework for the purposes of this study in an attempt to explore alignment between the world of work in South Africa and the WWM and RIASEC framework. For example, the I-PIA-M interest statement 'Operating a switchboard in order to relay incoming and inter-office calls to the correct parties, transfer calls and ensure connections for outgoing calls on a daily basis' was derived from the job of telephonist/switchboard operator under the Administration, Business and Office Work occupational grouping (Careers.co.za, 2006) and related to the I-PIA-M administrative and related services interest factor. Existing standardised questionnaires (such as the CISS (Campbell, 2002) and SDS (Holland, 1972)) was consulted for alignment of I-PIA-M statements with the design method applied by the standardised instruments. However, all items for the interests subscale of the I-PIA-M were self-constructed by using the RIASEC descriptions as foundation.

3.2.3 Research on career interests

Career interests represent an important variable for P–E fit in the context of career path congruence. In the context of this research, this section will aim to provide a critical overview of contemporary research related to Holland's (1997) personality and occupational types theory and the TWA/P-E correspondence theory. The aim will be to explore the relevance of these theories in the context of the contemporary world of work.

3.2.3.1 Research support for Holland's personality and occupational types theory

In research documenting the development of the South African Career Interest Inventory (SACII) and examining the structural validity of Holland's hexagon in the South African context (Morgan et al., 2015), the validity of Holland's theory was investigated with a sample of 985 university students in Study 1 and 175 university students and adults in Study 2 (Morgan et al., 2015). The results of the two studies presented suggest that contrary to prior research findings (Du Toit & De Bruin, 2002), Holland's hexagon may be applicable to the South African context and that career assessment and counselling based on the model may proceed if valid interest inventories are

used (Morgan et al., 2015). According to Morgan et al. (2015), with the development of the SACII, an initial step has been taken to produce a psychometric instrument for South Africans, thus attempting to address the call for the development of high-quality and psychometrically sound instruments in the South African context (Foxcroft, 2004; Paterson & Uys, 2005). Fouche et al. (2013), in investigating the feasibility of Holland's theory in contemporary environments, concluded that structured matching models, especially Holland's theory, will continue to hold promise for scholars and practitioners in vocational psychology and guidance throughout the world. Bullock, Andrews, Braud, and Reardon (2009) reported finding 43 translations of the SDS in their study of Holland's theory and the SDS, which indicates ongoing activity in this area. Further, the Diverse Populations bibliography included 531 citations concerning gender, national and ethnic diversity, which suggests that Holland's (1997) theory is boundary spanning in numerous ways.

In another study (conducted and reported by Dik et al., 2010), the relationship between Holland types (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional; Holland, 1997) and congruence and incongruence (i.e. lack of fit between an occupation's 3-letter Holland code and a person's lowest 3 Holland interest types) was investigated and tested to ascertain whether incongruence predicts unique variance in satisfaction beyond congruence. The results suggest that incongruence and congruence are negatively related and may overlap but are nevertheless distinct variables. Thus, researchers and counsellors should conceptualise these as constructs that are relatively independent rather than as anchors on opposite ends of a single dimension (Dik et al., 2010). According to Dik et al. (2010), one implication of this result is that although many individuals are likely to experience high congruence paired with low incongruence or low congruence paired with high incongruence, others may find that their job satisfies some of their strongest interests while simultaneously requiring them to engage in some tasks they may strongly dislike (high congruence, high incongruence). Still others may experience relatively low levels of both congruence and incongruence (Dik et al., 2010).

Nauta (2013) reported consistency in the relationship between Holland's type descriptions and individuals' values and life goals, as well as in the Big Five personality factors and measures of actual or perceived ability. In addition, another critical area of research relates to predictions about work-related outcomes (Nauta, 2013). In terms of congruence in relation to career choice, satisfaction and performance, Nauta (2013) argues that there is solid research evidence to show that RIASEC type and interest scores are predictive of many individuals' choices of study fields and careers. According to Nauta (2013), research findings indicate congruence between study

field and career choices and individuals' dominant RIASEC types. Furthermore, according to Nauta (2013), meta-analyses also support Holland's prediction that P–E congruence in relation to RIASEC types is associated with favourable outcomes, confirming that congruence is positively associated with job satisfaction (Nauta, 2013).

According to Nauta (2013), mixed empirical support exists in terms of Holland's concepts of differentiation and consistency, since these have received lesser research attention than in the case of congruence. Likewise, Holland's predictions in terms of vocational identity have received less emphasis than congruence.

In summary, career choice plays a vital role in person–career path congruence, representing a match between personality and the work environment (Schreuder & Coetzee, 2011). Interests reflect preferences for certain behaviours and activities, the context within which these preferred activities occur, and the outcomes associated with the preferred activities (Armstrong et al., 2008). Holland (1997) classifies individuals, jobs and environments into six personality types: realistic, investigative, artistic, social, enterprising, and conventional (RIASEC), while work environments are also assessed or described according to their degree of resemblance to six environmental types (Gottfredson & Holland, 1996). These preferences and aversions influence the choice of a work environment, and the environments are defined by the typical work activities and other demands placed on individuals (Armstrong et al., 2008; Schreuder & Coetzee, 2011). This section focused on Holland's (1997) theory of personality and occupational types, as defined by the RIASEC personality and environmental typology (Gottfredson & Holland, 1996). The relationship between Holland type (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional; Holland, 1997) and congruence and incongruence (i.e. lack of fit between an occupation's three-letter Holland code and a person's lowest three Holland interest types), as reported in literature, was also investigated. The aim is to understand the relationship between Holland's (Holland, 1997) theory of personality and occupational types and an individual's career choice (in the context of career interests) and its influence on person–career path congruence.

A study conducted by Phan and Rounds (2018) investigated Holland's (1997) congruence-satisfaction hypothesis using the like and dislike vocational duality. Congruence is typically determined by matching an individual's RIASEC profile to an occupation by utilising their highest like scores from a bipolar scale, whilst incongruence refers to the match between an individual's RIASEC dislikes (based on negative affect) and the RIASEC profile of their job (Phan & Rounds, 2018). The research conducted by Phan and Rounds (2018) has shown three fit indexes in

alignment with Holland's (1997) theory. The first fit index is based on the liking aspect, congruence, and is derived from affect anchors that capture affective responses to work activities that are high in activation and high in pleasantness. Phan and Rounds (2018) reported that active-positive congruence consistently predicted the expected intrinsic facets of satisfaction but not extrinsic facets like pay satisfaction. The second fit index based on the dislike aspect, active-incongruence, is derived from anchors capturing affective responses to work activities that are high in activation and high in unpleasantness. This index did not predict any of the facets of job satisfaction – despite structural analyses and confirmatory factor analysis indicating that a disliking aspect of vocational personality was driving the observed responses. The third fit index is based on the disliking aspect, passive-incongruence, and is derived from affect anchors that capture affective responses to work activities that are low in activation and high in unpleasantness. The finding in this regard reported that passive-incongruence negatively predicts the expected intrinsic facets of satisfaction but not extrinsic facets like pay.

A study conducted by Cewińska, Grzesiak, Kusideł, and Kabalski (2017), on the relationship between personality according to the theory of Holland with preferences in accounting, found that Enterprising and Conventional were the only two personality types that could indicate a relationship to the accounting career field.

3.2.3.2 Research support for the theory of work adjustment (TWA/PE-correspondence) model

According to Swanson and Schneider (2013), research focused on the prediction of satisfaction, satisfactoriness, work adjustment and tenure found strong support for the interactions between these constructs, mapping back to the first eight formal propositions of TWA/P-E correspondence (Dawis & Lofquist, 1993; Dawis, 1996; 2005). In addition, according to Swanson and Schneider (2013), the TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) can be applied to better understand current work trends, stages of career development and career adaptability for culturally diverse populations. Furthermore, research also supports the idea that the TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) could be a useful framework for enhancing understanding of the changing world of work, and contributes to positive psychology, which has natural connections to the field of vocational psychology (with a focus on mental health, well-being and life satisfaction: Swanson & Schneider, 2013). In addition, as stated in chapter 1, the notion of person-organisation career path congruence holds the premise that individual outcomes are most optimal when personal attributes (i.e. needs/preferences, interests, abilities, and values) and environmental attributes (i.e. career

areas/job types' demands and supplies) are compatible regardless of the level of these attributes (Van Vianen, 2018). As such, TWA/P-E correspondence requires not only a focus on vocational interests, but also abilities. In this context, this research will include abilities as a contributing factor towards person-organisation career path congruence.

Within this context and guided by the research aims, Holland's theory (personality and occupational types) is depicted in the RIASEC framework. The TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) alludes to the notion of person-job-fit. The TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) is considered a model of P–E vocational fit and supports Holland's (1997) personality and occupational types (Swanson, and Schneider, 2013). According to Swanson and Schneider (2013), the TWA consists of two models: a predictive model, focusing on the variables that explain whether individuals are satisfied with their work environments, which in turn predicts tenure in their work environments, and a process model, focusing on how the fit between individuals and their environments is attained and maintained. In TWA, employees and work environments are seen as having a reciprocal relationship that jointly affects tenure (i.e. length of employment). Occupations require employees to have certain abilities, and employees expect occupations to supply reinforcers (rewards) that meet certain needs (the pattern of which reflects their work values) (Su et al., 2015). Correspondence (or fit) between a job and a job holder is high when an employee meets or exceeds the abilities demanded by a job or a job meets or exceeds the needs of an employee (Su et al., 2015), which is supported by Holland (1997) that emphasised the importance of fit or congruence between and individual's personality and occupation. Both the TWA and Holland's theory evolved within the discipline of vocational psychology yet share a conceptual foundation with the broader field of P–E psychology (Swanson & Schneider, 2013).

According to Chuang (2013), P–E fit is faced with the following challenges: firstly, multidimensionality of fit (studying fit from only a single dimension is inconsistent with the way individuals experience fit because people are simultaneously nested in multiple aspects of an environment), consequently researchers should also consider the multiple content dimensions (e.g. values, goals, personality, and interests) of each individual dimension of P–E fit. Edwards and Cooper (1990), for example, argue that many researchers cover only a very limited number of content dimensions. Secondly, recent developments in P–E fit research have led to theorisations of fit based on multiple theories (Chuang, 2013). The integration of different fit theories would allow researchers to paint a richer portrait of P–E fit phenomena and investigate the unique effects of each theory on these phenomena (Kristof-Brown & Guay, 2011), involving

two or more dimensions of fit. According to Chuang (2013), a third challenge involves simultaneously assessing the contributions of various types of P–E fit to the theoretically related outcome constructs. Kristof-Brown and Guay (2011) assert that "multicollinearity is often a concern when determining the unique impact of various types of fit" (p. 37). In the context of the present study, the three constructs of career anchor preferences, career interests and abilities are integrated into a multidimensional measure (i.e. I-PIA-M) which is assessed in terms of discriminant validity.

Darrow and Behrend (2017) argue that there is a need to look beyond unidimensional definitions of P–E fit and to consider fit on a variety of dimensions and levels of the environment simultaneously. This has led to questions about how this multidimensional construct should be conceptualised. Darrow and Behrend's (2017) research included 688 employees from a variety of occupations and organisations who rated their fit in terms of various aspects of their work environment and several attitudinal and behavioural outcomes. The results indicated that P–E fit should be viewed as a formative concept and that it should slightly improve the prediction of outcomes involving P–E measures. In the reflective model, the dimensions are presumed to be manifestations of the levels of fit, so the causality flows from the levels to the dimensions (Darrow & Behrend, 2017). Likewise, when the levels are specified as reflective indicators of overall P–E fit, overall P–E fit is presumed to result in fit at each of the levels. In the formative model, the dimensions are also presumed to result in fit at the various levels. Fit at these levels, in turn, results in overall PE fit (Darrow & Behrend, 2017). The results of the study by Darrow and Behrend (2017), however, suggest that the levels of fit are multidimensional and that these dimensions and levels determine how employees experience and perceive fit. The authors consequently suggest that P–E fit should be conceptualised and modelled as a formative construct.

In summary, for the purposes of this research career-path congruence will be defined in relation to the Minnesota TWA (Dawis & Lofquist, 1984). The TWA views work as an interactive and reciprocal process between the individual and the work environment (Dawis & Lofquist, 1984). According to Eggerth (2008), the TWA provides a framework within which to predict the outcomes of the match between the individual and the work environment (predictive model) and to describe the ongoing process of interaction (work adjustment) between worker and environment (Eggerth, 2008). In the context of this research, the focus falls on the role of TWA as a guidance model in the context of P–E fit in relation to career path congruence. Correspondence refers to the match between worker needs and work environment reinforcers and may be used to predict job

satisfaction (Dawis & Lofquist, 1984). The match between worker abilities and the behavioural requirements of a job predicts satisfactoriness (Eggerth, 2008).

3.2.4 Insights gained

For the purposes of this study, the following insights are gained by including the TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) to explore career interests in this study:

- The Minnesota TWA (Dawis & Lofquist, 1984) is considered a model of P–E environment vocational fit, including person-job fit, and it supports Holland's (1997) personality and occupational types theory (Swanson & Schneider, 2013).
- The TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) can be applied to better understand current work trends, stages of career development, and career adaptability for culturally diverse populations.
- 'Correspondence' (or fit) between a job and a job holder is high when an employee meets or exceeds the abilities demanded by a job or a job meets or exceeds the needs of an employee (Su et al., 2015). Discorrespondence can occur when an individual's abilities and the environment's ability requirements are not at an acceptable level of alignment.
- Both the TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) and Holland's theory evolved within the discipline of vocational psychology yet share a conceptual foundation within the broader study of P–E psychology (Swanson & Schneider, 2013).

3.3 ABILITIES

When defining abilities, the constructs of abilities, aptitudes and skills are deemed to be separate yet highly related (Metz & Jones, 2013). This study will focus on an individual's self-perceived abilities/skills in relation to their career anchor preferences and career interests, taking into account the impact of aptitude. However, aptitude does not form part of the focus of this study. In the context of this research, abilities, together with career anchor preferences and career interests, form a critical component when determining the level of P–E fit from a career path congruence perspective. Abilities are studied in the context of person-job fit and the TWA/P-E correspondence theory (Dawis & Lofquist, 1993; Dawis, 1996; 2005) and their mapping in terms of WWM (Prediger, 2002) and Holland's (1997) personality and occupational types theory. Various research cited in Van Vianen (2018) relates the level of fit between abilities required by

jobs and an individual's ability profile to strain experienced from a career path congruence perspective, especially in relation to work performance and related to self-esteem. According to Van Vianen (2018) Individuals have relatively more difficulties with adapting affectively to environments that do not meet their needs and values than to misfits regarding their vocational interests and abilities. However more research is required in this regard. Earlier research suggested Individuals may craft their job so as to attain a better fit or may overestimate their abilities (Cable & DeRue, 2002).

3.3.1 Conceptualisation

Although the current study recognises the importance of mental capacity and the actual skills required by an individual, the focus of the current study is closely related to measuring self-perceived abilities against occupational activities. One of the aims of the current study is to define ability activities in the context of occupational and work-environment frameworks to guide the interpretation of the self-perceived ability scores on the I-PIA-M.

3.3.2 Theory

This section will discuss the various perspectives related to abilities in the context of career psychology.

3.3.2.1 Ability as physical or mental capacity

According to Schneider and McGrew (2013), the Cattell-Horn-Carroll (CHC) theory of cognitive abilities differentiates between domain-independent general capacities, acquired knowledge systems and sensory/motor-linked abilities. Domain-independent general capacities include fluid reasoning, impact of memory (short-term memory and long-term storage and retrieval), retrieval fluency, and general speed (including processing speed, reaction and decision speed, and psychomotor speed) (Schneider & McGrew, 2013). Acquired knowledge systems include comprehension knowledge, domain-specific knowledge, reading and writing, and quantitative knowledge (Schneider & McGrew, 2013). Sensory linked abilities include sensory (visual processing, auditory processing and olfactory abilities), motor (kinaesthetic abilities and psychomotor abilities) (Schneider & McGrew, 2013). For the purposes of the present study, acquired knowledge systems as defined by the CHC theory of cognitive abilities will be deemed relevant as possible influences regarding the notion of self-perceived abilities.

In terms of comprehension knowledge (depth and breadth of knowledge and skills that are valued by one's culture) (Schneider & McGrew, 2013), Table 3.2 presents the dimensions deemed relevant to the present study.

Table 3.2

Cattell-Horn-Carroll (CHC) Theory of Cognitive Abilities: Dimensions Relevant to the Current Study

Dimension	Descriptor	Subdimensions measured
Comprehension-Knowledge	Depth and breadth of knowledge and skills that are valued by one's culture	Communication ability (ability to use speech to communicate one's thoughts clearly). This ability is comparable to listening ability except that it is productive (expressive) rather than receptive.
Domain specific knowledge	Depth, breadth, and mastery of specialised knowledge (knowledge not all members of a society are expected to have) Specialised knowledge is typically acquired via one's career, hobby or other passionate interest	General science information (range of scientific knowledge (e.g. biology, physics, engineering, mechanics, electronics) Mechanical knowledge (knowledge about the function, terminology, and operation of ordinary tools, machines, and equipment)
Reading and writing	Depth and breadth of knowledge and skills related to written language.	Reading comprehension (ability to understand written discourse) Writing ability (ability to use text to communicate ideas clearly)
Quantitative knowledge	Depth and breadth of knowledge related to mathematics	Mathematical knowledge (range of general knowledge about mathematics. Not the performance of mathematical operations or the solving of math problems) Mathematical achievement (measured (tested) mathematics achievement)

(Schneider & McGrew, 2013)

144

3.3.2.2 Ability as a skill set

Ability refers to a ***skill*** acquired through a process of education, learning and development and can be related to organisational capability (Goldstein & Hilliard, 2007; Meyer, 2010). A skill is an ability to perform an activity in a competent manner and can be classified into three main types: Transferable/Functional (actions taken to perform a task, transferable to different work functions and industries, and based on ability and aptitude), Personal Traits/Attitudes (traits or personality characteristics that contribute to performing work and developed over a life span), and Knowledge-based (knowledge of specific subjects, procedures and information necessary to perform particular tasks and can be acquired through education, training and on-the-job experience) (Skillscan, 2012). According to Schreuder and Coetzee (2016), career management requires a focus not only on career interests but also enhancing the level of congruence between an individual's ability, the demand for certain skills and how the individual can acquire these skills. Skills acquisition plays a critical role in occupational goal attainment (Ostroff, Shin, & Feinberg, 2002).

3.3.2.3 Ability in the context of occupational activities from a TWA/P-E correspondence perspective

In the context of this research, fit includes person–vocation fit (the congruence between individual vocational interests and vocational characteristics), and person–job fit (fit between individual abilities and needs and the demands and supplies of the job. Person–vocation and person–job fit are considered complementary types of fit because they relate to attributes such as preferences, needs, and abilities that are complemented by environmental supplies and demands or vice versa (Van Vianen, 2018). In the context of the current study, abilities are mapped in terms of WWM and RIASEC. This approach ensures better integration ad a holistic approach to P-E fit/career path congruence.

This section will deal with work-related abilities in relation to Holland's (1997) types (RIASEC) and occupational groupings which influence career-path congruence. As stated earlier, career path congruence is influenced by the level of correspondence between individual and occupational/work environment satisfaction.

Holland's (1997) hexagon forms the core of the WWM (to be discussed in more detail in section 3.1.4.1 (iii)) to cluster careers (or job groupings) in relation to the Holland types (RIASEC) (Prediger, 2002).

In the context of the WWM (Prediger, 2002, p. 211) and the summary of career clusters and career areas (Prediger, 2002, p. 213), work-relevant abilities include non-cognitive abilities in addition to the usual cognitive abilities, and assume "basic and cross-functional skills" (Prediger, 2002, p. 215). According to Prediger (2002, p. 296), "it appears that measures of work-relevant abilities differ sufficiently from measures of ability self-confidence [self-efficacy beliefs, etc.] for both to be helpful when used in conjunction with measure of interests".

Originally, Holland (1997) associated 22 abilities and competencies with the types (RIASEC) (Prediger, 2002). According to Prediger (2002), many of these abilities and competencies (e.g. leadership, persuasive, social, artistic) were not routinely assessed by instruments at that point in time, resulting in Holland focusing on 12 of the abilities through which self-estimates are obtained via the Self-Directed Search (Holland, 1994).

In the context of the current study (i.e. investigate the development of an integrated measure for career anchor preferences, career interests and abilities towards career path congruence guidance), occupational frameworks (such as the O*NET model (O*NET Centre, 2007) are explored to relate the outcomes of the current study to the work environment, with the purpose of, in turn, relating the I-PIA-M to occupational/organisational career pathways.

The following O*NET (O*NET Centre, 2007) ability requirements are regarded as relevant to the present study:

- Oral comprehension – the ability to listen to and understand information and ideas presented through spoken words and sentences
- Written comprehension – the ability to read and understand information and ideas presented in writing
- Fluency of ideas – the ability to come up with a number of ideas about a topic (the number of ideas is important, not their quality, correctness, or creativity)
- Mathematical reasoning – the ability to choose the right mathematical methods or formulas to solve a problem
- Number facility – the ability to add, subtract, multiply, or divide quickly and correctly

3.3.3 Research on abilities

Research provides various perspectives on ability. These include views on ability as a physical or mental capacity, ability as a skill set and ability in the context of occupational activities. In the context of this study, the focus of the discussion will be ability in the context of occupational activities.

3.3.3.1 Work-relevant abilities in relation to Holland's (1997) types (RIASEC)

Additional related research on abilities has been conducted, resulting in ability listings captured in the Dictionary of Occupational Titles (DOT) (US DOL, 1991). These were then considered in the development of the O*NET model (O*NET Centre, 2007; Prediger, 2002).

The results of a study conducted by Anthoney and Armstrong (2010) are of particular value to the study in this thesis in order to explore the level of correlation between Holland's personality and occupational types (1997) and abilities (as defined in particular by Ackerman & Heggestad, 1997; Betz et al.,1989; Metz & Jones, 2013; and Snow, 1994; and to be discussed in more detail later in this chapter). In terms of the research aims of this thesis, the results of the study conducted by Anthoney and Armstrong (2010) are also pertinent to workplace occupational content such as the content model of O*NET (O*NET Centre, 2007), the International Standards Classification of Occupations (ISCO-08) (International Labour Organization, 2012) and the Organisation Framework of Occupations (OFO) (DHET, 2013). The OFO was discussed in Chapter 2:

The following ability-related results were reported by Anthoney and Armstrong (2010) in relation to the fit between Holland's (1997) theory and the O*NET (O*NET Centre, 2007) model:

- *Verbal abilities*. Verbal comprehension was not successfully integrated for the O*NET data but a good fit was found based on both male and female self-ratings that were oriented toward the A–S region of the circumplex. Verbal expression results were found to be similar to verbal comprehension, in that they did not fit the model for the O*NET data but were a strong fit to Holland's theory for both men and women and were also linked with the A and S types.
- *Idea generation and reasoning abilities* Idea generation had a strong fit to the circumplex based on O*NET data and male self-ratings oriented toward A and was not successfully integrated into the model for women. Problem sensitivity was not successfully integrated for the O*NET data, and the RIASEC correlations based on male and female self-ratings were

not statistically significant. Deductive reasoning was not successfully integrated based on O*NET data and female self-ratings, and the RIASEC correlations for the male self-ratings were not statistically significant. Inductive reasoning was not successfully integrated based on the O*NET data and women's self-ratings. For men's self-ratings, inductive reasoning was linked with the I–A region but this result may be difficult to interpret because the $R2$ confidence interval ranged from .12 to .91. Information ordering had a strong fit to the model for the O*NET data, oriented between the R and I types, but was not successfully integrated into the model for female ratings and did not have a statistically significant RIASEC correlation for male ratings. Category flexibility was not successfully integrated based on O*NET data and male self-ratings, and female RIASEC correlations were not statistically significant.

- *Quantitative abilities.* Quantitative abilities did not reach the fit cut off in the O*NET data but was a good fit for men and a strong fit for women; however, these differences between the O*NET data and the self-ratings were not statistically significant. Quantitative abilities was oriented toward the C–R region of the circumplex in both the male and the female self-ratings.

- *Memory.* Memorisation was a good fit oriented toward the A–S region of the circumplex in the O*NET data and did not have statistically significant RIASEC correlations for either the male or the female self-ratings.

- *Perceptual abilities.* Perceptual abilities fit the model well for the O*NET data and for the male and female self-ratings. For the O*NET data, perceptual abilities had a strong fit with the R type; for female ratings it a good fit was found tending to the R–I region, as well as a good fit for men oriented in the I–A region. The difference in angle between the O*NET and male ratings was statistically significant.

- *Spatial abilities.* Spatial orientation was a strong fit with the R type for the O*NET data and a good fit for female self-ratings oriented in the R–I region. The RIASEC correlations for male self-ratings were not statistically significant. Visualisation was a strong fit for the O*NET data oriented between R and I but not successfully integrated for women and did not have statistically significant RIASEC correlations for men.

- *Attentiveness.* Selective attention was a strong fit in the O*NET data, oriented between the R and I types but did not have statistically significant RIASEC correlations for either male or female ratings. Time sharing did not fit the circumplex and no statistically significant correlations were found for the O*NET data and male and female self-ratings.

The following skills-related results were reported by Anthoney and Armstrong (2010) on the fit between Holland's (1997) theory and the O*NET (O*NET Centre, 2007) model:

- *Basic skills.* Written communication was a strong fit in the O*NET data and male self-ratings and a good fit for female self-ratings, oriented toward the A region of the circumplex for the O*NET data and toward the A–S region for the female and male ratings. The magnitude of fit (R^2) was significantly larger based on male self-ratings compared to the O*NET data for written communication, although both fit well to the circumplex. Oral communication was a strong fit in the O*NET data and both the female and male self-ratings were oriented toward the A–S region of the circumplex. Mathematics had a strong fit to the model for the three groups, oriented toward the R region for the O*NET data and toward the R–C region for men and women. Science was a strong fit in the O*NET data and both the female and male self-ratings, oriented toward the I region of the circumplex for the O*NET data and for women and the R–I region for men. Critical thinking was a strong fit with the A region for the O*NET data and a good fit for female self-ratings oriented toward the R–I region of the circumplex, with a statistically significant difference between these angles. RIASEC correlations for male self-ratings of critical thinking skills were not statistically significant.
- *Social skills.* Teaching was a strong fit in the O*NET data oriented toward the A region, a good fit in the A–S region for female self-ratings, and a strong fit with the S region for male self-ratings. The difference between the O*NET and male angles for teaching was statistically significant. Influencing was a strong fit in the O*NET data and both female and male self-ratings and was oriented toward the S region of the circumplex. Service orientation was a strong fit in the O*NET data and both the female and male self-ratings and was oriented toward the S region of the circumplex for O*NET and toward the A–S region for men and women.
- *Technical skills.* Technical skills was a strong fit in the O*NET data and both the female and male self-ratings, oriented toward the R region of the circumplex. Judgement and decision-making was not successfully integrated into the circumplex for the O*NET data but was a strong fit for the male self-ratings oriented toward the C–R region of the circumplex, and a good fit for female self-ratings, with a wide angle confidence interval encompassing the C–R–I region. Systems analysis was a strong fit with the R region for the O*NET data and a good fit for both male and female self-ratings, oriented toward the C–R region of the circumplex.
- *Resource management skills.* Time management was a strong fit in the O*NET data oriented toward the A–S region of the circumplex but was a poor fit for the male self-ratings, and the

149

RIASEC correlations were not statistically significant for the female self-ratings. Financial resources management was not successfully integrated for the O*NET data but was a strong fit for the female and male self-ratings, oriented in the E–C region of the circumplex. Material resources management was not successfully integrated for the O*NET data but was a good fit for both the male and female self-ratings oriented toward the C–R region of the circumplex. Personnel resources management was a strong fit with the S region for the O*NET data, was oriented with the S–E region for male self-ratings and had a wide confidence interval oriented in the A–S–E region for female self-ratings.

- *Complex problem-solving skills.* Complex problem solving was a strong fit in the O*NET data and a good fit for male self-ratings but was not successfully integrated for female self-ratings. For the O*NET data it was oriented toward the I region of the circumplex but was oriented toward the E–C region of the circumplex for men. This difference in angle was statistically significant.

Overall, 18 out of 45 (40%) ability vectors and 41 out of 48 (85%) skill vectors were fitted into the RIASEC framework (Anthoney & Armstrong, 2010). These results suggest that skill ratings are more effectively integrated into the RIASEC framework than ability ratings. For example, linking perceptual and spatial ability ratings to the R type and verbal ability ratings to the A type was partly supported, but technical and systems analysis skill ratings were consistently linked to the R type and written and oral communication skill ratings were consistently linked to the A type (Anthoney & Armstrong, 2010).

In the context of career guidance, various assessment instruments such as the CISS have developmental roots stretching back a number of decades. David P. Campbell, the primary developer of the CISS (Campbell, 2002), worked on the development and revision of another well-known interest instrument, the Strong Interest Inventory (SII) (Campbell, 1977), and the Interest Determination, Exploration and Assessment System (IDEAS) (Johansson, 2007) which was based on Holland's codes. The CISS provides the following measurement scales for the individual taking the assessment: Basic Interest and Skill scales, Orientation scales, Occupational scales, Special scales and Procedural checks, whilst the SII measures interests, not skills or abilities. In terms of dimension labelling, the CISS corresponds as follows with Holland's (1997) types (RIASEC) (Campbell, 2002): Influencing (Enterprising); Organising (Conventional); Helping (Social); Creating (Artistic); Analysing (Investigative); Producing (Realistic); and Adventuring (Realistic). In designing the CISS, Campbell (2002) emphasised the importance of

correspondence between the interests and skills scales of the CISS instrument through parallel scales; for example, if the test includes an 'Artistic' interest scale, the test should include an 'Artistic' skills scale to measure the level of correlation between an individual's career interests and self-perceived skills set. Critical insights proposed by Campbell (2002) based on validation studies include that skills can be measured in the same manner that interests have been measured, that the resulting measurements are related to occupational choices, and that the standardised measures of self-reported skills appear to track some intertwined combination of the actual skill itself and the respondent's sense of self-confidence in carrying out the skill.

Taylor and Donnelly (2017) revisited the application of the CISS in the South African context. Respondents were assessed for various purposes including career counselling, vocational choice and personal career growth (Donnelly, 2009, 2010). In terms of reliability, internal consistency was reported in the South African context relevant to the basic scales of the CISS. The results did indicate that the constructs (Basic interests and skills dimensions) are valid on an adequate level. However, the Donnelly studies (Donnelly, 2009, 2010) hoped that a close fit would be achieved, and thus further research in the South African environment is encouraged (Taylor & Donnelly, 2017).

3.3.3.2 Occupational frameworks (such as the O*NET model)

Handel (2016) investigated the strengths and limitations of the O*NET model (O*NET Centre, 2007) in light of the fact that the Occupational Information Network (O*NET) was designed to replace the US Dictionary of Occupational Titles (Handel, 2016). Handel (2016) concluded that the very size of the database is daunting and requires attention when selecting variables; the importance scales are redundant and can probably be ignored without great loss of information; many variables have ambiguous or fuzzy meanings; and the reasonableness of basic descriptive results should always be checked before proceeding to take the meaning at face value. In providing career-based counselling services, the Psytech Occupational Interests Profile applies the O*NET content model to assess an individual's personal work needs, personal qualities, career and occupational interests (Psytech International, 2012). Job recommendations provided in the individual feedback report are derived by comparing the individual's profile to a database of jobs listed on the O*NET job resource centre (Psytech International, 2012). An analysis of the O*NET found that more work should be done on finding ways to group O*NET variables together and rank-order them in terms of importance. In addition, research should focus on determining whether the data from O*NET can be used to describe jobs and workers from other countries

outside the US, and future work should focus on examining whether competency importance varies by job zone or job type (Burrus, Jackson, Xi, & Steinberg, 2013).

In summary, the concept of cluster careers (or job groupings) in the context of ability and in relation to the Holland types (RIASEC) is regarded as crucial for understanding person–career path congruence. In the context of the WWM (Prediger, 2002, p. 211) and in line with the summary of career clusters and career areas (Prediger, 2002, p. 213), work-relevant abilities include non-cognitive abilities in addition to the usual cognitive abilities, and assume "basic and cross-functional skills" (Prediger, 2002, p. 215), with Holland's (1997) hexagon forming the core of the WWM. Various workplace-related models, such as the O*NET (O*NET Centre, 2007), consider workplace ability requirements in the context of person–career path congruence. When defining abilities, the constructs of abilities, aptitudes and skills are regarded as separate yet highly related (Metz & Jones, 2013). In terms of the O*NET (O*NET Centre, 2007) model, abilities include oral comprehension, written comprehension, oral expression, written expression, fluency of ideas, originality, mathematical reasoning, number facility, speed of closure, perceptual speed, spatial orientation, and visualisation. In addition to these abilities, the O*NET (O*NET Centre, 2007) proposes work enforcers, which refers to factors in the work environment that support the individual in applying his/her and which include aspects of the work that are made up of specific needs that are important to a person's satisfaction. These are manifested through value alignment, level of ability utilisation and accomplishment, recognition, healthy interpersonal relationships, level of support from others including managers, and level of allowed independence in terms of executing tasks/taking decisions.

3.3.4   Abilities as defined for the purpose of this study

Typically, ability refers to the physical or mental capacity (learnt or innate) to complete a specific act or task. With due consideration of self-perceived ability, as explained in this section, for the purposes of this study ability is defined as *self-perceived abilities in relation to career interests and career anchor preferences as measured by the I-PIA-M.*

For the purposes of the present study, the following self-perceived abilities will be explored (with due relevance to RIASEC as indicated below). Abilities' definitions are based on various source input such as the O*NET abilities model as per the O*NET Centre (2007), O*NET Data Dictionary (O*NET, 2014), WWM (Prediger, 2002). In addition, published research data on abilities such as Anthoney and Armstrong (2010) and relevant job data published in Jobfile South Africa publication

(Careers.co.za, 2006) were also considered. Relevant RIASEC codes published in Hollands Dictionary of Occupational Codes (Gottfredson, & Holland, 1996) relevant to jobs within the respective career interest fields were consulted to propose a link between the abilities and the RIASEC:

- *Abstract reasoning and Verbal ability (related to artistic (A) investigative (I) and social (S))* - the ability to use diagrams, symbols or shapes instead of words or numbers – it involves identifying the underlying logic and then determining the solution. In addition, it includes the ability to evaluate the logic of various kinds of arguments.
- *Business acumen (related to enterprising (E))* – understanding main business drivers in order to influence decision-making
- *Managing others (related to enterprising (E) and social (S))* – the ability to manage and encourage people, optimise their outputs and effectively manage relationships in order to achieve agreed goals
- *Numerical ability (related to realistic (R)* – the ability to make correct decisions or inferences from numerical data. The tasks set and data presented are highly relevant to a range of careers.
- *Resilience (related to conventional (C))* – maintains a positive outlook at work; works productively in a pressurised environment; keeps emotions under control during difficult situations
- *Technical ability (related to realistic (R))* – work undertaken by hand involving aesthetic, artistic, coordinated, dexterous, physical and sustained use of hands or fingers; craft and keyboard skills; correct use of tools and equipment. It includes the willingness to learn and develop opportunities in own discipline and area of expertise

The approach followed was to analyse job related information, job related information retrieved from published industry such as the ONET Content Model (ONET, 2007; 2014) apart from published competency repositories from various industries. The approach followed will be discussed in more detail under Section 3.6.3 where the ability items of the I-PIA-M is discussed.

In summary, abilities, aptitudes and skills are separate yet highly related constructs (Metz & Jones, 2013; Snow, 1994). As a result, ability assessments consist of a series of tasks or work samples and measure the relative ease with which an individual can perform the task (Metz & Jones, 2013). Skills represent the proficiency, competence or dexterity that has been acquired through practice and repeated use (Metz & Jones, 2013). According to Metz and Jones (2013),

skills may be domain-general (e.g. interpersonal communication, leadership) or domain-specific (e.g. ability to analyse blueprints). As discussed earlier, work relevant abilities represent an important factor in person-career path congruence (Prediger, 2002).

3.3.5   Insights gained

For the purposes of this study, the following insights have been gained by including abilities in this study:

- The concept of ability may be defined from various perspectives, namely, ability as physical or mental capacity, ability as a skill set, and/or ability in the context of occupational activities.
- Ability for the purposes of this study is defined as *meaningful functional activities representing the core of career clusters or career areas and which are relevant to core work output requirements as defined by the typical jobs associated with such career cluster demarcations.*
- Ability in the context of occupational activities includes Holland's (1997) hexagon, which forms the core of the WWM, relates to cluster careers (or job groupings) including reference to work related abilities and the Holland types (RIASEC) (Prediger, 2002)..
- The TWA/P-E correspondence theory emphasized the importance of congruence between an individual's interests and abilities (apart from values) and that of the work environment (person-job fit), leading to greater career satisfaction.
- The design of the I-PIA-M items were largely influenced by the CISS (comparing interests and self-perceived skills/abilities levels in comparison with interests). In addition, the CISS uses an activity-based approach thereby promoting person-career-job congruence thus supporting the P-E correspondence theory. In addition, due to a focus in this research on Holland's (1997) personality and occupational types theory, the Self-Directed Search (SDS) was also consulted to promote congruence between the items of the I-PIA-M and Holland's (1997) theory to inform the 3-letter RIASEC code towards identifying the corresponding career fields of interest as per Holland's dictionary of occupational titles. To test the validity and reliability of the findings and conclusions of the I-PIA-M, it was decided to also apply the already standardised IDEAS questionnaire to the case study participants as part of the qualitative research. Furthermore, the value of incorporating the Savickas Career Construction Interview Questionnaire as part of the qualitative study was to confirm the level of congruence between the outcomes of the I-PIA-M and respondents' career life themes. Not only was the outcomes of the I-PIA-M confirmed but the career construction interview added supplementary value towards a better understanding of the integration of quantitative survey results and qualitative research thereby

confirming the value of a mixed research approach towards person-organisation career path congruence (see chapter 6).

3.4 SYNTHESIS AND CRITICAL EVALUATION

Leong et al. (2014) reported strong interrelatedness between the factors of Schein's career anchors (career anchor preferences) and Holland's (1973) RIASEC career interest typology. Leong et al. (2014) conducted a study to report on the psychometric properties of the Career Orientations Inventory (COI) based on a sample of 165 midcareer college graduates (all males) from Dartmouth College (graduated 1962) and subsequently made several suggestions for the use and interpretation of the COI.

To assess the convergent and discriminant validities of the career anchors, Leong et al. (2014), ran correlations between the career anchors and Holland's (1973) career interest subscales (realistic, investigative, artistic, social, enterprising, conventional).

The strengths of Leong et al.'s (2014) study may be summarised as follows (adapted from Leong et al., 2014, p. 535):

- Factor analysis has provided overall support for the factor structure of the COI. Items were expected to load on six of the anchors, namely service to a cause, general management competence, geographical stability, entrepreneurship/creativity, technical competence, and job tenure security.
- The reliability assessment indicated that most of the anchors, except for that of lifestyle integration, have good internal reliability. The results also showed that the removal of any item from each anchor would reduce the internal reliability of the respective anchor. This means that the current COI, despite having 41 items, is a parsimonious measure that should not be further shortened.
- Validity assessment has demonstrated that the COI possesses some degree of convergent and discriminant validity with existing career measures, namely, Holland's (1973) typology of career interests. For instance, the technical competence anchor was positively related to the investigative subscale of Holland's (1973) framework. This was expected because investigative individuals often try to develop and acquire professional knowledge on their jobs (Holland, 1996), which is also descriptive of individuals with a technical competence anchor.

155

- The results revealed a significant positive association between the general managerial competence anchor and Holland's (1973) enterprising subscale. Enterprising individuals express interest in persuading or directing others, and often define their success by their power status in a social setting (Holland, 1996), traits that are characteristic of individuals with a general managerial competence anchor who enjoy managing and coordinating the efforts of others.

- On the other hand, the lifestyle integration anchor was not found to be related to any of Holland's (1973) subscales. Lifestyle integration focuses on the need to maintain balance across multiple domains of one's life, such as family, leisure and work. This is not a dimension that Holland's (1973) typology assesses; hence, it was not surprising that the lifestyle integration anchor did not show any significant relationship with any of Holland's (1973) subscales.

- These findings demonstrated some degree of convergent and discriminant validity in the COI.

The weaknesses associated with the COI based on Leong et al.'s (2014) study can be summarised as follows (adapted from Leong et al., 2014, p. 535):

- Despite the above strengths, the results have also uncovered some weaknesses associated with the COI.

- In the factor analysis, the five items designed to measure the anchor of pure challenge loaded on two factors. This suggests that the pure challenge anchor could possibly be further categorised into two categories.

- Items that were supposed to represent the lifestyle integration anchor loaded on three factors. These cross-loadings across three factors suggest that items under lifestyle integration do not unequivocally measure a single construct. In fact, several of the lifestyle integration items cross-loaded onto the autonomy anchor. Autonomy may reflect the preference for having freedom at work to establish one's identity, while lifestyle integration emphasises the freedom to balance work and personal demands. These two anchors appear to be somewhat overlapping. Such findings imply that the lifestyle integration anchor is not entirely stable, and this is further supported by the autonomy anchor. This is a weakness of the COI, and calls for caution to be exercised by individuals, career counsellors, or managers when making recommendations to individuals who appear to have a lifestyle integration anchor. This is because scoring high on these items may not necessarily mean individuals view lifestyle

156

integration as central when making career specialty decisions. Without further study, it is difficult to characterise what essential career anchor these items assess.

- While the correlation results supported the fact that the COI does have some degree of convergent and discriminant validity, not all findings were clear in this regard. For example, the technical competence anchor was negatively correlated with Holland's (1973) conventional subscale. This is in contrast to Nordvik's (1991) finding of a positive correlation between the technical competence anchor and the conventional subscale. Also, the Leong et al.'s (2014) study found that job tenure security and geographical security anchors were not related to any of Holland's subscales, while Nordvik found both anchors to be positively related to the conventional subscale. These discrepant results could either be due to the limited validity of the COI, or because we used a Likert-type scale and Nordvik, in contrast, used an ipsative scale for responding to the COI items.

- Such contrasting findings suggest the need to re-evaluate and examine what exactly these career anchors mean conceptually, how they should actually relate to existing career measures or job types, and also whether the anchors can be generalised cross culturally. Such understanding would help researchers and counsellors make better use of the career anchors to predict individuals' career interests and make recommendations for their career specialty options. Further studies are required to answer these questions.

Previous research includes that of Nordvik (1996), during which the relationships between the variables measured by the Myers-Briggs Type Indicator (MBTI), ipsative scales measuring the concepts in Holland's theory of personality and occupational types and Schein's theory of career anchors were investigated by analysing data from 1063 Norwegian adults (232 females and 831 males) belonging to various groups. These included personnel groups going through organisational development programmes, university students, persons seeking career guidance, and applicants for various kinds of jobs taking tests during the recruitment programme (Nordvik, 1996). All participants had had a varied occupational and educational background, with an age range from 18 to 70 years with a mean of 40.0 years and a standard deviation of 9.1 years.

In terms of the vocational and career anchor scores in occupation groups, the significance of Nordvik's (1996) research lies in the fact that the results of the factor analysis agreed closely with previous analyses of the vocational inventory and the career inventory (Nordvik, 1991), thus testifying stability in the pattern of differential preferences among the vocational and career anchor concepts across samples.

In summary, research related to the correlation between Schein's career anchors (Schein, 1990) and Holland's (1997) theory, indicates a strong correlation between the various career anchors and career interest subscales of Holland's (1997) theory of vocational choice (realistic, investigative, artistic, social, enterprising, conventional). As such, there seems to be stability in the pattern of differential preferences among the vocational and career anchor concepts across various research samples. Whilst some abilities contained in the O*NET model reported a fit to Holland's (1997) theory, there were instances where the individual's ability did not appear to fit the model for the O*NET data but was a strong fit to Holland's theory. The results of the research conducted by Anthoney and Armstrong (2010) suggest that skill ratings contained in the O*NET model are more effectively integrated into the RIASEC framework than ability ratings. This represents an important factor to consider in developing an integrated career anchor preference, career interests and abilities measure to guide career path congruence.

3.5 DEVELOPING THE INTEGRATED MEASURE

This section will focus on the theoretical frameworks that underpin the development of an integrated measure (i.e. the I-PIA-M) to investigate the influence of an individual's career anchor preferences, career interests and abilities (self-perceived abilities) in relation to career path congruence from a world of work (WWM) perspective (a P–E fit approach).

In developing the Integrated Preferences, Career Interests, and Abilities Measure instrument (I-PIA-M), the various theoretical frameworks discussed in this chapter were considered. A summary of the relationship between the I-PIA-M and the various theories are presented in Table 3.3.

Table 3.3

The I-PIA-M in Relation to Theories Relevant to Career Anchor Preferences, Career Interests and Career Abilities

Construct	Description (definition)	Scale sub-constructs of the I-PIA-M	Theoretical models
Career anchor preferences	Career anchor preferences refer to an individual's preferred career orientation in terms of Schein's (1996) career anchors as manifested by the highest three anchors influencing an individual's career choices	40 items of Schein's (1990) COI were used to assess the eight career anchors. Career anchors include: 1. Technical/Functional Competence, 2. General Managerial Competence, 3. Autonomy/Independence, 4. Security/Stability, 5. Entrepreneurial/Creativity, 6. Service/Dedication to a Cause, 7. Pure Challenge, 8. Lifestyle.	Schein's (1978; 1990; 1996) framework of career anchors as measured by the Career Orientations Inventory (COI) (Schein, 1996) Applies principles of the theory of person-vocation fit (Schein, 1996)
Career interests	Career interests refer to Holland's (1997) six personality types in relation to matching work environments. Career interests denote six areas of interests indicated by Holland's (1997) six personality types and the matching work environment (i.e. where, type of work, and how people like to work).or career field/occupational category	The classification, labelled RIASEC, represents six theoretical personality types: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), Conventional (C). The six personality types and their career interests are mapped onto occupational categories (career fields) to determine person–work environment fit (Gottfredson & Holland, 1996). Items in the Integrated Preferences, Career Interests, and Abilities Measure: For the purposes of this study, career fields of interest measured by the I-PIA-M relate to the RIASEC as follows: 1. Activity Driven (R); 2. People Oriented (S); 3. Environment driven (A); 4. Business and Related Careers (E; 5. Customer and Support Services (E, S); 6. Financial and Numerical Related Services (E); 7. Scientific Orientation (I, R);	Holland's (1997) RIASEC classification framework of career interests Applies principles of the theory of person-vocation fit (Van Vianen, 2018) The following scales were consulted to inform the method of item design (based on RIASEC) of the I-PIA-M: • Campbell Interest and Skills Survey (CISS) (Campbell, 2002), • Self-Directed Search (SDS) (Holland, 1972) Note: All items of the I-PIA-M were self-constructed and informed by the RIASEC framework.

		8. Administrative and Related Services (C); 9. Information Technology (I, R).	
Abilities	Ability refers to the physical or mental capacity (learnt or innate) to complete a specific act or task. For the purposes of this study ability is defined as self-perceived abilities in relation to career interests and career anchor preferences as measured by the I-PIA-M.	Holland (1997) associated 22 abilities and competencies with the RIASEC types. The WWM (Prediger, 2002, p. 211) provides 26 career areas (grouping of similar jobs) in 12 regions (clusters). The career areas and regions represent various combinations of data, ideas, people and things work tasks. Career areas are located on the WWM according to the relative standing of their member occupations on the Data/Ideas and People/Things work task dimensions (ACT, 2009).For the purposes of this study, perceived abilities measured by I-PIA-M relates to the RIASEC and WWM as follows: 1. Verbal Ability (S) (6 items); 2. Numerical Ability (R) (6 items); 3. Abstract Reasoning (A) (5 items); 4. Technical Ability (R)(3 items); 5. Managing Others (E, S) (12 items); 6. Business Acumen (E)(3 items); 7. Inspiring and Leading Others (E, S)(6 items); 8. Resilience (C) (5 items).	TWA/P-E correspondence (Dawis & Lofquist, 1993; Dawis, 1996; 2005) Holland's (1997) RIASEC classification framework The World of Work Map (WWM) (Prediger, 2002) Applies principles of the theory of person-job fit (Van Vianen, 2018) The following scales were consulted to inform the method for designing items of the I-PIA-M: • Campbell Interest and Skills Survey (CISS) (Campbell, 2002), • Self-Directed Search (SDS) (Holland, 1972). • Published literature such as Anthoney & Armstrong (2010), • O*NET content model and data dictionary (O*NET Centre, 2007; 2014). • Job File South Africa (MindMuzik, 2006).
Person-environment career path congruence	Mapping individuals' career anchor preferences, career interests and self-perceived abilities onto categories of occupations/career pathways	Mapping for career path congruence is done as follows: • • Determine three dominant career anchor preferences as measured by Schein's COI • Determine 3-letter code in terms of the RIASEC against the Dictionary of Occupational Titles • Determine the interest and abilities mapping of the respondents' career anchor preferences, career interests and abilities profiles in terms of the World of Work Map (WWM) requirements • Determine the level of integration between the RIASEC, WWM to predict same career or occupational field The I-PIA-M is applied as follows in career intervention context to guide career path congruence: • Respondents complete the I-PIA-M (comprising of career anchor preferences, career interests and abilities) • Respondents complete the IDEAS questionnaire that are based on RIASEC	World of Work Map (WWM: Prediger, 2002) Holland's (1997) RIASEC types for occupational categories Applies principles of the theory of person-organisation fit (Van Vianen, 2018) O*NET content model and data dictionary (O*NET Centre, 2007; 2014).

		• Derive an integrated view of the three (3) highest scores in terms of career anchor preferences, career interests and abilities • Conduct the Career Construction interview to supplement/support the results of the I-PIA-M • Determine the level of congruence between the career anchor preferences, career interests and abilities profile, and corresponding career or occupational field (current and future) in terms of the RIASEC and WWM • Verify correspondence between I-PIA-M and IDEAS results	

3.6 ITEMS OF THE I-PIA-M

This section will outline the process in item design for the I-PIA-M.

3.6.1 Career anchor preferences

For the purposes of measuring career anchor preferences, the Career Orientations Inventory (COI) (Schein, 1990) was incorporated unchanged into the I-PIA-M. The questionnaire comprises 40 items, measuring eight constructs, applying the 5-point Likert scale (ranging from never true for me, occasionally true for me, often true for me, always true for me). The number of items per sub-construct is presented in table 3.4.

3.6.2 Career interests

As indicated in table 3.3, the following scales were consulted to inform the method of item design of the I-PIA-M: Campbell Interest and Skills Survey (CISS) (Campbell, 2002), Self-Directed Search (SDS) (Holland, 1972). However, all items were self-constructed by using the RIASEC framework as a basis.

Although no items from the CISS and SDS were included into the I-PIA-M, the method applied by these two instruments to measure career interests was deemed applicable to this research. Both instruments apply the Likert scale method. The CISS provides a list of interest items (for example, 'An actor or actress, performing on the stage, TV, or in movies') which the respondent needs to rate in terms of the 6-point Likert scale method (ranging from strongly like, like, slightly like, slightly dislike, dislike, and strongly dislike). Interests are measured by the SDS by listing occupations (such as 'airplane mechanic') requesting respondents to select a 'yes' response if the occupation appeals to them, or 'no' if a dislike or uninteresting. For the purposes of the I-PIA-M, following the likert scale method to design, the design method of the CISS was deemed more feasible, and in addition, the fact that the CISS uses statements to be rated rather than occupational listing. Subsequently, in alignment with the CISS design method, items if the I-PIA-M were rated using a Likert-type scale with six response categories, ranging from "Strongly Dislike (1)", "Dislike (2)", "Slightly Dislike (3)", "Slightly like (4)', "Like (5)", to "Strongly Like (6)".

In terms of the career interests section of the I-PIA-M, all items were derived from workplace related published job information such as the Jobfile South Africa (Careers.co.za, 2006), ONET

content model (ONET Centre, 2007; 2014) and published industry competency frameworks. Items were related to Holland's (1997) RIASEC classification framework of career interests. The number of items per sub-construct is presented in table 3.4. Refer to Appendix A for an overview of the items generated for the purpose of the study.

The I-PIA-M subscales for career interests are (See Appendix A):

- Activity driven:
  Physical activities are performed, often equipment and vehicles are operated/controlled, and complex/technical activities are accomplished as job outputs.
- Administrative service:
  Supporting business operations by delivering routine, complex and specialised administrative duties in accordance with predefined processes and procedures.
- Business careers:
  Business careers involve managing a business, project or production processes, and developing and implementing business processes and plans. Advertising, marketing and the sale of goods and/or services to customers are included in this career field. It often involves managing, motivating and leading staff.
- Customer support:
  Customer support involves helping customers efficiently, in a friendly manner. It is the act of taking care of the customer's needs by providing and delivering professional, helpful, high quality service and assistance before, during, and after the customer's requirements are met.
- Environment driven:
  Work environment preferences include various factors. Such factors include the preference for outdoors (the need to work in the open air and typically will not pursue careers that requires office bound activities), indoors (the need to work within a building and typically will pursue careers involving office bound activities), formal (the need to work in high disciplined environments governed by rules and regulations and where high emphasis is placed on image, formal dress codes and ceremonies) or informal (the need to conduct daily activities in a more flexible and relaxed manner without jeopardizing quality of service and/or products).
- Financial/ numerical:
  People interested in a career involving finances/working with numbers, have the need to work with figures, making simple and complex calculations in solving problems of a various nature. Typically, they are well organized individuals with well-developed analytical and problem-

163

solving skills and an eye for detail. In order to succeed in this field of work an above average ability in Mathematics is required.

- Information technology

    People interested in a career involving Computers or Information technology, have the need to work with complex data in either raw or final format. Typically, they are well organized individuals with well-developed analytical and problem-solving skills.

- Legal:

    Legal professionals study, develop and apply law. In a corporate context, the focus of the legal professional is to determine and ensure that all business practices, policies and procedures meet regulatory requirements, and to advise the business on how to protect legal interests.

- People oriented:

    Careers involve working with, communicating with, and teaching people. These occupations often involve helping or providing service to others.

- Scientific orientation:

    People interested in a career in the Sciences have an investigative mind, approaching matters and issues from a scientific perspective. They have the need to collect, collate data, analyse it, interpret and report on findings, providing others with their valuable conclusions. They are well organized with well-developed analytical and problem solving skills tend to apply logical thinking in a more informal, yet procedure-controlled environment.

3.6.3 Abilities

As indicated in table 3.3 The following scales were consulted to inform the method of item design of the I-PIA-M: Campbell Interest and Skills Survey (CISS) (Campbell, 2002), Self-Directed Search (SDS) (Holland, 1972). However, all items were self-constructed.

Although no items from the CISS and SDS were included into the I-PIA-M, the method applied by these two instruments to measure self-perceived abilities was deemed applicable to this research. Both instruments apply the Likert scale method. The CISS provides a list of activity items (for example, 'Act in a local theatre production') which the respondent needs to rate in terms of the 6-point Likert scale method (ranging from strongly like, like, slightly like, slightly dislike, dislike, and strongly dislike). In addition, the responded is asked to rate self-perceived skill items (for example, 'Acquiring the necessary resources to carry out your plan') in terms of the 6-point Likert scale

method (ranging from expert, good, slightly above average, slightly below average, poor, and none). In terms of the CISS, a comparison is made between activities and level of self-perceived skills against these, which is then related back to the interests measured by the CISS to provide a comparative view of interest versus self-perceived abilities to inform potential career alternatives. Abilities are measured by the SDS by listing activities (such as 'Fix electrical things') requesting respondents to select a 'L' response if they like doing the activity, or 'D' if a dislike of doing the activity. In addition, the SDS requests respondents to rate competency statements in similar fashion, by selecting, for example, in terms of the competency statement 'I have used wood shop power tools such as power saw or lathe or sander' in terms of a 'Y' for yes or 'N' for no depending on whether the activity was performed competently or never/poorly performed in the past respectively. For the purposes of the I-PIA-M, following the likert scale method to design, the design method of the CISS statements was deemed more feasible. In alignment with the SDS design method for competencies, and that of the CISS in measuring self-perceived skills levels, the I-PIA-M design requires items to be rated against the Likert-type (scale 1 – 6), i.e. "None" (1), "Poor" (2), "Slightly Below Average" (3), "Slightly Above Average' (4), "Good" (5), and "Expert" (6).

In terms of the abilities section of the I-PIA-M, the approach followed was to analyse job related information (such as published in Job File South Africa, Careers.co.za, 2006). Careers.co.za (2006) in partnership with VT Career Management and the South African Qualifications Authority (SAQA) researched and compiled a catalogue of jobs against occupational groupings, similar method to that of Holland (1997). In addition, job related information retrieved from published industry competency repositories against job families/job groupings were analysed to supplement information derived from the Jobfile South Africa publication (Careers.co.za, 2006). Such publications include the O*NET Content Model (O*NET, 2007; 2014) apart from published competency repositories from various industries. Ability statements were derived from the said sources and related to the career abilities identified against the various model factors discussed in this chapter and in relation to the RIASEC framework for the purposes of this study in an attempt to explore alignment between the world of work in South Africa and the WWM and RIASEC framework. For example, the I-PIA-M interest statement 'Operating a switchboard in order to relay incoming and inter-office calls to the correct parties, transfer calls and ensure connections for outgoing calls on a daily basis' was derived from the job of telephonist/switchboard operator under the Administration, Business and Office Work occupational grouping (Careers.co.za 2006) and related to the I-PIA-M administrative and related

services interest factor. Existing standardised questionnaires (such as the CISS (Campbell, 2002) was consulted for alignment of I-PIA-M statements with the design method applied by the standardised instrument.

The I-PIA-M subscales for abilities are (See Appendix B):

- Abstract reasoning:
  Abstract reasoning implies the ability to use diagrams, symbols or shapes instead of words or numbers – it involves identifying the underlying logic and then determining the solution.
- Business acumen:
  The ability to understanding main business drivers in order to influence decision-making.
- Managing others:
  The ability to manage and encourage people, optimise their outputs and effectively manage relationships in order to achieve agreed goals.
- Numerical ability:
  The ability to make correct decisions or inferences from numerical data. The tasks set and data presented are highly relevant to a range of careers.
- Resilience:
  The ability to maintain a positive outlook at work; works productively in a pressurised environment; keeps emotions under control during difficult situations.
- Technical ability:
  Work undertaken by hand involving aesthetic, artistic, coordinated, dexterous, physical and sustained use of hands or fingers; craft and keyboard skills; correct use of tools and equipment. It includes the willingness to learn and develop opportunities in own discipline and area of expertise.
- Verbal ability:
  Verbal ability refers to the ability to evaluate the logic of various kinds of arguments.

The number of items per sub-construct is presented in table 3.4. Refer to Appendix B for an overview of the items generated for the purpose of the study.

Table 3.4

Items and Subscales of the I-PIA-M

Construct	Items
Career anchor preferences	40 items of Schein's (1990) COI were used to assess the eight career anchors. Career anchors include: • Technical/Functional Competence (5 items), • General Managerial Competence (5 items), • Autonomy/Independence (5 items), • Security/Stability (5 items), • Entrepreneurial/Creativity (5 items), • Service/Dedication to a Cause (5 items), • Pure Challenge (5 items) • Lifestyle (5 items).
Career interests	For the purposes of this study, career fields of interest measured by the I-PIA-M are measured through 125 items (see Appendix A): • Activity Driven (45 items); • People Oriented (14 items); • Environment driven (20 items); • Business and Related Careers (31 items); • Customer and Support Services) (27 items); • Financial and Numerical Related Services (26 items); • Scientific Orientation (17 items); • Administrative and Related Services (10 items); • Information Technology (9 items).
Abilities	For the purposes of this study, perceived abilities measured by I-PIA-M are measured through 41 items (see Appendix B): • Verbal Ability (6 items); • Numerical Ability (5 items); • Abstract Reasoning (5 items); • Technical Ability (3 items); • Managing Others (10 items); • Business Acumen (3 items); • Inspiring and Leading Others (6 items); • Resilience (5 items).

3.7 APPLICATION OF FRAMEWORK IN PERSON–CAREER PATH CONGRUENCE

This section explains in theoretical and practical terms how the measure will potentially be applied in career guidance and counselling for person–career path congruence. Following the steps of the scale development procedure outlined in Chapter 4, the Integrated Preferences, Career Interests, and Abilities Measure instrument (I-PIA-M) aims to address the following focus areas to guide career path congruence.

Career anchor preferences	This focus involves the individual completing the Schein's (1990; 2006) Career Orientations Inventory (COI) as in integrated aspect of the new scale: technical/functional competence; general managerial competence; autonomy/independence; security/stability; entrepreneurial/creativity; service/dedication to a cause; pure challenge; lifestyle. This will provide insight into career anchor preferences in its role as an integrated aspect of the new scale.
Career interests	The individual completes the Career Interests section of the I-PIA-M to gain insight into the various career interests to be measured, i.e. activity driven; people oriented; environment driven; business and related careers; customer and support services; financial and numerical related services; scientific orientation; administrative and related services; information technology and legal.
Career abilities (self-perceived abilities)	The individual completes the Abilities section of the I-PIA-M to gain insight into the various self-perceived abilities to be measured, i.e. verbal ability; numerical ability; abstract reasoning; technical ability; managing others; business acumen; and resilience.

Once the individual has completed all three components, an integrated profile is generated that considers the outcomes of the individual's career anchor preferences, career interests and abilities profile. The individual's profile can then be mapped to organisational competency requirements in order for the individual to be aligned to the world of work requirements for which they are best suited.

Consider the following example:

An individual completes the COI and reports a three-letter code representing autonomy and independence, pure challenge, and technical functional competence in terms of career anchor preferences. In completing the career interest section of the I-PIA-M, the individual reported a career interest related to Financial and numerical related services, and Information technology. In terms of the RIASEC framework, the career field related to Financial and numerical related services is typical related to Enterprising (E), Social (S), and Conventional (C). Information technology again is typically related to Investigative (I), Realistic (R) and Enterprising (E).

In completing the ability section of the I-PIA-M, the individual reports self-perceived abilities related to Business acumen, Numerical ability, and Technical ability (with a sub-score for Information technology).

Summarising the outcomes of the I-PIA-M, the individual's profile reads as follows:

Career anchor preferences: Autonomy and independence

Pure challenge

Technical functional competence

Representing AU/CH/TF in terms of the COI

Career interests: Financial and numerical related services

Information technology

Related to ESC/IRE in terms of RIASEC

Abilities (self-perceived):   Business acumen

Numerical ability

Technical ability

Related to E, S, R, C, in terms of RIASEC – note that in relation to the abilities profile, the individual reported a four-letter RIASEC profile, however the combinations correspond with the letters contained in the RIASEC profile under the career interests.

Proposed career clusters: Individual's overall integrated profile relates to working with data, working with ideas and working with people in terms of the WWM.

Related to Business Management & Administration, Finance, and Information Technology in relation to the O*NET Career clusters.

Integration comment of significance: Although the individual reported a three-letter code on the COI, in terms of the ability profile on the I-PIA-M the individual fits the occupational/work environment through two RIASEC three-letter codes, thus inferring multidimensional career pathways. The notion is further supported by analysing the individual's self-perceived ability profile, inferring a three-path occupational profile. However, the three-way occupational profile inferred by the abilities profile is interrelated through shared three-letter codes on RIASEC.

Considering the level of congruence between COI and the I-PIA-M career interests and abilities profile for the individual, the assumption can be made that the individual should be equally satisfied in following a financial or information technology career in a business or enterprise-driven environment.

This research will seek to investigate the above assumption through empirical research conducted in the context of the research questions stated for this study.

3.8 CHAPTER SUMMARY

The general aim of this research was to explore the development of an integrated measure of individuals' career anchor preferences (as postulated by Schein's career anchor theory), career interests (as postulated by Holland's [1973, 1997] theory) and abilities (as postulated by theories on individual trait differences in relation to career selection [Betz et al., 1989; Snow, 1994]). The research further aims to explore the use of the integrated measure in facilitating P–E fit (as postulated by Dawis & Lofquist, 1993) and career path congruence, that is, using career-related aspects to assess and predict P–E fit (as postulated by Holland's (1997) theory on personality and occupational types) and in the context of the TWA (interaction model) of Dawis and Lofquist (1984).

This chapter outlined the approach to be followed in applying the I-PIA-M within the contemporary work environment to enhance career path congruence (P–E or world of work fit based on career anchor preferences, career interests and abilities).

The next chapter (Chapter 4: Research method) will describe and explain the empirical study.

CHAPTER 4

RESEARCH METHOD

In this chapter, the research methodology applied in conducting the study is explained. The chapter starts with an outline of the research approach, followed by a description of the research participants as well as the research procedure applied in developing and administering the new scale. The statistical procedures applied in testing the psychometric properties of the new I-PIA-M scale are also discussed and the procedure for applying the tested I-PIA-M in practice is outlined.

4.1 RESEARCH APPROACH

The current research followed a mixed-method approach. Firstly, a cross-sectional quantitative research design was followed in developing and administering the new scale (I-PIA-M). Secondly, a qualitative research design was applied involving the use of a case study approach when administering the empirically tested I-PIA-M in practice.

In terms of the qualitative research method, an interpretivist paradigm was utilised, which expedited an in-depth understanding and interpretation of the themes and congruence meanings revealed during my interaction as researcher with the respondents. As discussed in Chapter 1, a quantitative approach (for description, comparing groups and relating variables by using numerical data) was applied together with a qualitative approach (identifying career life themes through a career construction interview method and relating themes to current and future career pathways). The qualitative study followed an explorative, descriptive, case study approach (McMillan & Schumacher, 2009) to facilitate an in-depth investigation of the congruence between respondents' career anchor preferences, career interests and abilities and their current and desired career pathways in the relevant organisation. The qualitative approach enabled the collection of evidence from multiple perspectives within a particular organisational context (Creswell, 2013) to better understand the phenomenon of individual–organisational career path congruence.

At its most basic level, mixed methods research involves the use of both qualitative and quantitative data in a single research project. The use of mixed methods as research approach enables researchers to collect, analyse and integrate both quantitative and qualitative data in a

single study or in a sustained long-term programme of inquiry to address their research questions (Creswell, 2013). Creswell (2013) clarifies the need for a mixed approach to be applied during a particular study as follows (the first four bullet points are applicable to this study):

- A need for different, multiple perspectives, or more complete understandings
- Need to confirm quantitative measures with qualitative experiences
- Need to explain quantitative results
- Need for better contextualised instruments, measures or interventions to reach certain populations
- Need to enhance experiments
- Need to gather trend data and individual perspectives from community members
- Need to evaluate the success of a programme by using a needs assessment and a test of programme success.

As inferred by Creswell (2013), a mixed-method research approach is feasible in research projects where one data source may not be enough to explain the phenomenon, the initial results may require further explanation, or a second method is needed to enhance a primary method. For interpretation purposes, quantitative and qualitative data are integrated by comparing or combining results from both methods (Creswell, 2013). It renders the researcher with the opportunity to combine elements of quantitative and qualitative research approaches to gain better understanding and insights regarding the phenomenon with the purpose to expand and strengthen a study's conclusions and therefore, contribute to the published literature (Johnson et al. 2007; Schoonenboom & Johnson, 2017). Bryman (2006) added additional aspects to the rationale to support a mixed research approach, including that it enhances the integrity of findings, it could uncover additional relationships between variables, enhances the usefulness of findings for practitioners who need to apply it in their field of practice, confirm and test the hypothesis, and accommodate diversity of views on the research topic.

Schoonenboom & Johnson (2017) provides a view on secondary design criteria that should be thoughtfully considered during the construction of a strong mixed methods research design:

- Will the study be addressing (a) the same part or different parts of one phenomenon? (b) different phenomena? or (c) the phenomenon/phenomena from different perspectives?
- Will the study generate a new substantive theory, test an already constructed theory, or achieve both in a sequential arrangement? Or is the researcher not interested in substantive theory based on empirical data?

- Will the study have an explicitly articulated ideological drive (e. g., feminism, critical race paradigm, transformative paradigm)?

- What specific quantitative sampling method(s) will be used? What specific qualitative sampling method(s) will be used? How will these be combined or related?

- Degree to which the research participants will be similar or different. For example, participants or stakeholders with known differences of perspective would provide participants that are quite different.

- Degree to which the researchers on the research team will be similar or different: For example, an experiment conducted by one researcher would be high on similarity, but the use of a heterogeneous and participatory research team would include many differences.

- Will the phenomenon be studied naturalistically, experimentally, or through a combination of these?

- Degree to which the methods similar or different: For example, a structured interview and questionnaire are fairly similar but administration of a standardized test and participant observation in the field are quite different.

- What validity criteria and strategies will be used to address the defensibility of the study and the conclusions that will be drawn from it?

- Will there be essentially one research study or more than one? How will the research report be structured?

Having considered the research questions in the context of the above, this research will apply the mixed (quantitative and qualitative) research method.

Although the focus of this research will be the triangulation mixed method, reference to the complementarity approach is included since the qualitative study may yield enriched insights towards the research findings. The purpose of triangulation is to seek convergence, corroboration, correspondence of results from both (quantitative and qualitative) methods (Greene, Caracelli & Graham, 1989). In a complementary mixed-method research approach, one of the benefits of a quantitative-qualitative method is that is allows the opportunity to measure overlapping but also different facets of a phenomenon thereby enriching the understanding of the phenomenon (Greene, Caracelli & Graham, 1989).The benefit of triangulation design is that complimentary yet distinctly different data on the same topic is gathered from different sources (quantitative and qualitative) which can then be integrated for analysis and interpretation, with the challenge to draw everything together and to deal with data discrepancies (Almalki, 2016). Triangulation will

be discussed in more detail under section 4.8.6 in this chapter. Based on the logic of convergence embedded in the classic conceptualization of triangulation, it is important that quantitative and qualitative methods be different from one another with respect to their inherent strengths and limitations/biases and that both method types be used to assess the same phenomenon (Greene, Caracelli & Graham, 1989).

This study followed an explanatory sequential design method that is depicted in Figure 4.1. Typically, explanatory sequential design involves a phase of quantitative data collection and analysis, followed by qualitative data collection and analysis, and integrated interpretation In accordance with the explanatory sequential design method, a respondent pool of N = 270 participants was selected to participate in the quantitative study based on the representative random sampling method. The participants were subsequently requested to complete the I-PIA-M.

Following the quantitative research data collection, five (n = 5) participants who did not form part of the quantitative study of N=270 were included in the qualitative study. The participants completed the I-PIA-M and the career construction interview (Savickas, 2012) was conducted with these individuals. The data obtained were analysed through the application of the Savickas career construction life story theme building. Data were then integrated, consolidated in terms of quantitative and qualitative research methods and interpreted in line with the interpretive paradigm approach.
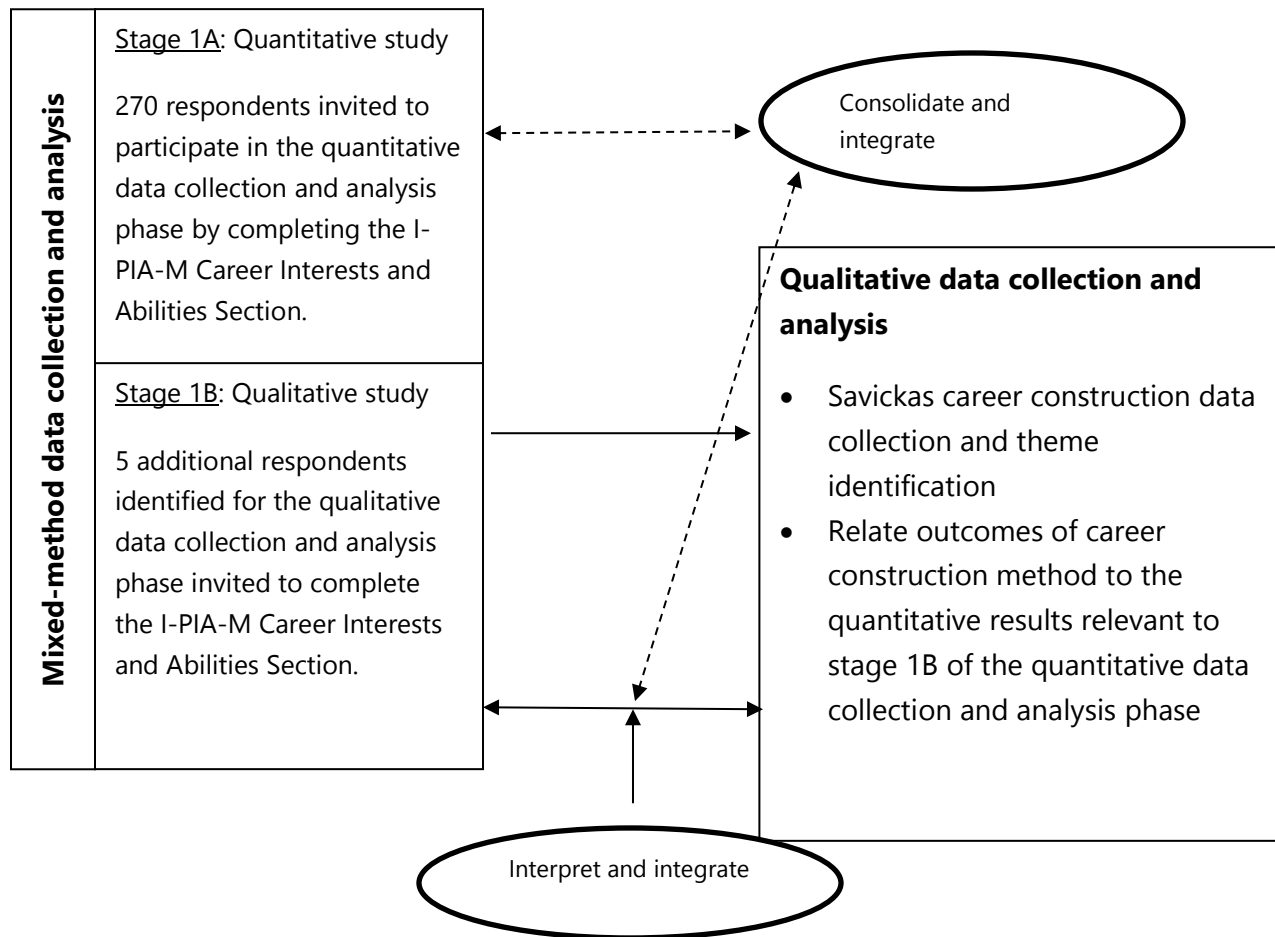
Figure 4.1 Explanatory sequential mixed design method

4.2 PARTICIPANTS AND PROCEDURE: QUANTITATIVE STUDY

The participants comprised a random sample of predominantly employed adults (N = 270) who were registered for undergraduate studies in the economic and management sciences fields at a South African higher education open distance learning institution for a particular year. Random sampling is ideal and highly representative if all subjects participate, and an unbiased random selection and a representative sample are important in drawing conclusions from the results of a study (Sharma, 2017). However, random sampling is not possible without a complete list of population members. It may prove disruptive to isolate members from a group, the time-scale may be too long, and the data/sample could change if not all subjects participate (Sharma, 2017). With randomisation, the use of a representative sample of a population allows for generalisation to a population (Creswell, 2013).

Research ethics forms a critical factor when conducting research. Rosenthal and Rosnow (2009) define research ethics as the minimum standards of moral principles that govern the behaviour of researchers. These include meeting the social and professional obligations that the researcher owes to research participants and participating organisations. As part of efforts to uphold these requirements, the following ethical considerations were adhered to:

- Seeking appropriate approval from the target organisations
- Getting informed consent from research participants
- Maintaining utmost confidentiality of results
- Ensuring the maximum practical level of anonymity of participants
- Using relevant literature applicable to the study
- Conducting research within recognised parameters
- Acknowledging all sources from which information and literature were obtained
- Where the researcher lacks expertise, for example on data analysis, consulting experts in relevant areas to ensure fidelity and credibility of results
- Informing participants about the reasons for, and results of, the research
- Compiling the thesis and reporting all information according to prescribed guidelines.
- Adhering to the requirements of the Protection of Personal Information Act (Act No. 4 of 2013) by protecting and safeguarding the demographics and primary score data of all respondents partaking in this study and only reporting on data trends in an anonymous fashion.

Ethics and permission to conduct the study were dealt with through the internal procedures of the Bureau of Market Research (University of South Africa) that assisted with the sampling and data collection. Questionnaires were mailed to 3000 randomly selected undergraduate students who were registered for studies in the economic and management sciences fields for the particular year, yielding a response rate of 9% (n = 277). Data cleaning resulted in a final useable sample of N – 270. The postal facilities of the institution were used to mail the questionnaires. Each questionnaire included a covering letter to obtain informed consent from the participants for using their responses for research purposes only. The letter explained the purpose of the research, procedure, potential benefits, confidentiality, anonymity, voluntary participation and withdrawal. Participants were requested to complete the questionnaires and return them by mail to the researcher using an enclosed return envelope.

The characteristics of the sample are summarised in Table 4.1.

Table 4.1

Sample Characteristics

Biographical characteristic	Subgroup	Frequency	%	Cumulative %
Race	African	149	55.19	55.19
	Coloured	18	6.67	61.85
	Indian	24	8.89	70.74
	White	77	28.52	99.26
	Other	2	0.74	100
Total		270		
Gender	Male	72	26.67	26.67
	Female	198	73.33	100
Total		270		
Age	25 years and younger	72	26.77	26.77
	26–40	158	58.74	85.50
	41–55	39	14.50	100.00
	Missing data	1		
Total		270		
Job level	Senior/Executive management	16	6.11	6.11
	Middle management	52	19.85	25.95
	First-level supervision	39	14.89	40.84
	Staff	91	34.73	75.57
	Independent contractor	14	5.34	80.92
	Not employed at present	50	19.08	100.00
	Missing data	8		

Total		270		
General level of career satisfaction	Very dissatisfied	13	4.83	4.83
	Dissatisfied	63	23.42	28.25
	Satisfied	163	60.59	88.85
	Highly satisfied	30	11.15	100.00
	Missing data	1		
Total		270		
General level of job satisfaction	Very dissatisfied	24	9.20	9.20
	Dissatisfied	78	29.89	39.08
	Satisfied	138	52.87	91.95
	Highly satisfied	21	8.05	100.00
	Missing data	9		
Total		270		

As shown in Table 4.1, the sample was predominantly black (African, coloured, Indian) and female. Of the sample, 71.48% were black, of which 55.19% were African, 8.89% Indian and 6.67% coloured, with 0.74% other. Further, 73.33% of the sample was female. In terms of age, the sample represented two predominant groups, namely, the 26 to 40 year age group represented by 58.74% of respondents (establishment and maintenance career life stage) and the early life career stage (25 years and younger), which was represented by 26.77% of respondents. In addition, 71.74% of respondents indicated being satisfied with their general level of career satisfaction, whilst 60.92% reported a general level of job satisfaction, while 23.42% reported being dissatisfied with their level of career satisfaction, and 29.89% reported being dissatisfied with their level of job satisfaction. Table 4.1 also shows that 40.85% of respondents held various levels of managerial jobs, with 34.73% holding non-managerial jobs, 5.34% being independent contractors and 19.08% being unemployed. Note that missing data (not provided by participants) in terms of age, job level, general level of career satisfaction and general level of job satisfaction was not included as part of % and cumulative %.

4.3 PARTICIPANTS AND PROCEDURE: QUALITATIVE STUDY

Purposive or deliberate sampling was used to recruit the participants for the qualitative study. The purposive sampling technique, also called judgement sampling, is the deliberate choice of an informant based on the qualities the informant possesses. Typically, participants are selected according to the needs of the study (hence the alternate name, deliberate sampling); applicants who do not meet the profile are rejected. It was important in the context of this research, to collect information from cases that are likely to produce the most information relevant to person career path congruence, hence the purposive subtype of critical case sampling was applied. According to Strewig & Stead, (2001) this type of sampling is particularly useful if a small number of cases can be sampled providing they are the ones more likely to provide a wealth of information. In the context of this study, individuals from the establishment of and established (maintenance) career life stages were selected and school leavers and entry level candidates were not considered. This a non-random technique that does not need underlying theories or a set number of informants. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience (Bernard, 2002; Lewis & Sheppard, 2006). The advantages of using purposeful sampling is that qualitative research designs can involve multiple phases, with each phase building on the previous one. In such instances, different types of sampling techniques may be required for each phase. Purposive sampling is useful in these instances because it provides a wide range of non-probability sampling techniques for the researcher to draw on (Sharma, 2017). However, purposive samples, irrespective of the type of purposive sampling used, are prone to researcher bias (Sharma, 2017) and the subjective and non-probability-based nature of unit selection (i.e. selecting people, cases/organisations) in purposive sampling means that it may be difficult to defend the representativeness of the sample (Sharma, 2017).

Five respondents were recruited who did not form part of the quantitative study, all of which were mostly from the same organisation [Human Resources Consulting organisation (n=4) and Health Services facility (n=1)]. The criteria for inclusion included race, gender, and the establishment of and established (maintenance) career life stages. Life stages associated with entry level and retirement were excluded from this exercise while current and future career pathways were explored. Candidates were identified as individuals who required career guidance for future development purposes. Most participants were selected from the 26 to 40 age group and were

predominantly from the white and African ethnic groups. Although no age or ethnic group were excluded, it was important that the participants were still in the establishment or maintenance career life stage. Ethical requirements were complied with and participant identity protected. All participants were assured of the purpose of the exercise and confidentiality in writing, and consent to participate was obtained. Participation was voluntary.

The characteristics of the participants in the qualitative study are summarised in Table 4.2.

Table 4.2

Characteristics of Participants (Case Study Approach)

Respondent	Race	Gender	Age	Job level	Current career path	Desired career path	Level of career satisfaction
Respondent A	African	Female	26–40	Staff	Personal assistant to the Executive	Human resources Financial services	Dissatisfied
Respondent B	White	Female	41–55	Independent contractor	Human resource consulting	Human resource consulting Specialist career path	Satisfied
Respondent C	Coloured	Male	26–40	First-level supervision	Nursing (Registered nurse)	Nursing manager/matron Horticulturist	Very dissatisfied
Respondent D	African	Female	26–40	Staff	Personal assistant to the Executive	Legal profession General business management	Dissatisfied
Respondent E	African	Male	26–40	Staff	Human resource consulting	Human resources Nursing/Medical Sciences Specialist career path	Satisfied

4.4 RESEARCH METHOD: PHASE 1 – DEVELOPMENT OF THE SCALE

This phase relates to empirical research aim 1

Research aim 1 was to empirically operationalise the constructs of career anchor preferences career interests and abilities into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context.

The development of the Integrated Career Anchor Preferences, Career Interests, and Abilities Measure instrument (I-PIA-M) questionnaire took place in line with existing scale development protocols. According to DeVillis (2003), when theoretical variables cannot be directly observed, scales are developed to measure the phenomena. A critical element in the contribution of knowledge to a specific field of study is that the measurement scales should have reliable and valid properties (Du Preez, Visser, & Janse van Noordwyk, 2008). Likert-type scales are commonly used to measure attitude, providing a range of responses to a given question or statement. Typically, there are six categories of response, from, for example, 1 = strongly disagree to 6 = strongly agree, although there are arguments in favour of scales with seven or an uneven number of response categories. Likert-type scales fall within the ordinal level of measurement; that is, the response categories have a rank order but the intervals between values cannot be presumed equal. The general guideline for an analysis of effective category functioning is a minimum of ten responses in each category. The average measure (average of the ability estimates of all participants endorsing a particular response category) of the categories is expected to increase in size as the value of the underlying variables increases (Leung & Tsang, 2010).

A potential set of items is identified for inclusion in the measure if the items are relevant to the constructs, for example career anchor preferences, career interests and abilities, under enquiry. The critical steps included in the scale construction involve selecting a response format, generating an item pool and obtaining face and content validity (DeVellis, 2003). The choice of which item response format best suits the intended participants is important.

As shown in Figure 4.2, there are six steps of scale development:

- Step 1 involved a thorough literature review by defining constructs and determining domain content.
- Step 2 – items were generated for the research and the appropriateness of the items was determined. Although the design method was derived from existing standardised questionnaires such as the CISS and SDS, items were self-constructed and derived from workplace related published job information such as the Jobfile South Africa (Careers.co.za, 2006), O*NET content model (O*NET Centre, 2007; 2014) and published industry competency frameworks. The RIASEC framework also informed the construction of items. To ensure content validity, the process of generating items was guided by the aims of the research. The outcome of the literature review was used as a base for item generation. The

draft questionnaire was reviewed by six subject matter experts who assisted in the refinement of items. The scale was then administered to the targeted population and sample. Ethical principles were applied to the administration of the I-PIA-M questionnaire.

- Step 3 consisted of testing the scale for initial factor structure. The full data set (N = 270) of the final sample of (N = 270) was selected for the purpose of testing the factor structure of the scale (Exploratory Factor Analysis: EFA).
- Step 4 involved finalising the scale for further statistical analysis after the EFA.
- Step 5 involved testing the scale for construct validity (CFA) and internal consistency reliability in terms of the total data set (N = 270).
- Step 6 involved measurement scale refinement and further statistical analysis to achieve the research aims.

The returned questionnaire was recorded and screened for completeness (missing values and inappropriate responses). Items were coded in preparation for capturing on a spreadsheet for further statistical analysis.

In terms of scale development, the following steps were deemed critical for scale development. Steps 1 to 4 will be discussed in this chapter, and steps 5 to 6 will be discussed in Chapter 5: Research results: Exploratory factor analysis.

Scale development procedure:

Sub-step 1: Defining constructs & determining domain content

Sub-step 2: Items are generated for research and appropriateness of items determined

Sub-step 3: Designing and conducting studies to test the scale

Sub-step 4: Finalising the scale

Sub-step 5: Measurement scale administration

Sub-step 6: Measurement scale scoring
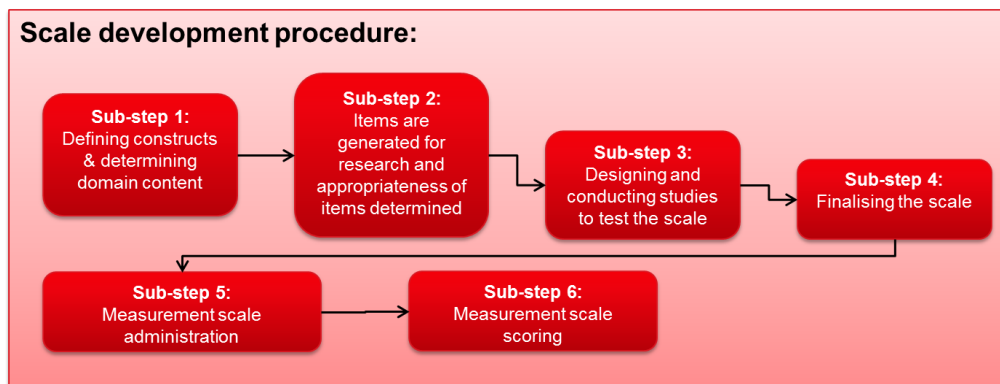
Figure 4.2. Steps in scale development procedure

4.4.1 Conceptualisation of the constructs

Career anchor preferences refer to an individual's preferred career orientation in terms of Schein's (1996) career anchors as manifested by the highest three anchors influencing an individual's career choices. Career anchor preferences are represented by Schein's (1990) career anchors framework, which serves as a guide for individuals when making career decisions. The individual completes the Schein's (1990) Career Orientations Inventory (COI) as in integrated aspect of the new scale I-PIA-M): technical/functional competence; general managerial competence; autonomy/independence; security/stability; entrepreneurial/creativity; service/dedication to a cause; pure challenge; lifestyle.

Schein's (1990; 2006) COI was used as an integrated subdimension of the new scale (I-PIA-M). The COI has proven reliability and validity in the South African context. Exploratory factor analysis was applied by Coetzee and Schreuder (2009) to determine whether the underlying factor structure of the COI subscales resembled the hypothesised eight-factor original career anchor model obtained by Schein (1978) during a study measuring internal career orientations in the South African organisational context. Moreover, CFA was also used to assess the construct validity of the data obtained with the COI by testing the relationships among the items or observed latent variables that comprise each of the eight career anchor constructs by Coetzee and Schreuder (2009). Considering the fact that demographic profile of respondents could influence the outcomes, in terms of the reliability analysis conducted in the CFA, five of the eight constructs' reliability was acceptable, with estimates ranging from 0.71 to 0.85 (Coetzee & Schreuder, 2009). In terms of the pure challenge construct, the items relating to the nature of challenging problems were deleted in order to improve the reliability coefficients of the subscale. The general management, autonomy/independence and service/dedication to a cause career anchor constructs were retained in the CFA best fit model (the five-factor model), showing a similar factor structure and equal factor loadings across particularly the African and white groups and to a lesser degree across the Indian and coloured groups (Coetzee and Schreuder, 2009). As the item intercepts were found to be significantly different across all constructs, the findings by Coetzee and Schreuder (2009) indicate that comparisons of latent variable means across the four ethnic groups seem only to be valid for the African and white participants. In Coetzee and Schreuder's study (2009), the construct 'lifestyle' yielded the lowest reliability (0.46), followed by the technical/functional (0.59) and security/stability (0.68) constructs. These constructs were not

included for further analysis by Coetzee and Schreuder (2009). The sample size could have influenced these results as African participants predominated (n = 1 592), followed by Whites (n = 976), Indians (n = 224) and Coloureds (n = 186). A more heterogeneous sample in terms of age, race, gender and occupational levels might have yielded different results (Coetzee & Schreuder, 2009).

Career interests, as discussed in Chapter 3, are based on Holland's theory (Holland, 1997) of personality and occupational types which plays a vital role in the career guidance process. Career interests refer to Holland's (1997) six RIASEC personality types in relation to matching work environments. Career interests denote six areas of interests indicated by Holland's (1997) six personality types and the matching work environment (i.e. where, type of work, and how people like to work) or career field/occupational category. Appendix A provides a breakdown of the items generated in the context of the various interests measured. The interests were directly related to Holland's RIASEC framework which was discussed in Chapter 3: activity driven (R); people oriented (S); environment driven (A); business and related careers (E); customer and support services (E, S); financial and numerical related services (E); scientific orientation (I, R); Administrative and related services (C); information technology (I, R). All items were derived from workplace related published job information such as the Jobfile South Africa (Careers.co.za, 2006), O*NET content model (O*NET Centre, 2007; 2014) and published industry competency frameworks.

For the purposes of this study ability is defined as self-perceived abilities in relation to career interests and career anchor preferences as measured by the I-PIA-M. Holland (1997) associated 22 abilities and competencies with the RIASEC types. The WWM (Prediger, 2002, p. 211) provides 26 career areas (grouping of similar jobs) in 12 regions (clusters). The career areas and regions represent various combinations of data, ideas, people and things work tasks. Career areas are located on the WWM according to the relative standing of their member occupations on the Data/Ideas and People/Things work task dimensions (ACT, 2009). For the purposes of this study, perceived abilities measured by I-PIA-M relates to the RIASEC and WWM as follows: verbal ability (S); numerical ability (R); abstract reasoning (A); technical ability (R); managing others (E, S); business acumen (E); Inspiring and Leading Others (E, S); resilience (C). Appendix B provides a breakdown of the items generated in the context of the various abilities measured. All items were derived from workplace related published job information such as the Jobfile South

Africa (Careers.co.za, 2006), O*NET content model (O*NET Centre, 2007; 2014) and published industry competency frameworks.

Person-environment career path congruence refers to mapping individuals' career anchor preferences, career interests and self-perceived abilities onto categories of occupations/career pathways. Mapping for career path congruence is done as follows: determine 3-letter code in terms of the RIASEC against the Dictionary of Occupational Titles; determine the interest and abilities mapping of the respondents' career anchor preferences, career interests and abilities profiles in terms of the World of Work Map (WWM) requirements; determine the level of integration between the RIASEC, WWM to predict same career or occupational field. The I-PIA-M is applied as follows in career intervention context to guide career path congruence: respondents complete the I-PIA-M (comprising of career anchor preferences, career interests and abilities); derive an integrated view of the three (3) highest scores in terms of career anchor preferences, career interests and abilities conduct the career construction interview (CCI) (Savickas, 2012) to supplement/support the results of the I-PIA-M; determine the level of congruence between the career anchor preferences, career interests and abilities profile, and corresponding career or occupational field (current and future) in terms of the RIASEC and WWM.

4.4.2   The development of the Integrated Career Anchor Preferences, Career Interests, and Abilities Measure instrument (I-PIA-M) questionnaire

The development of an instrument such as the I-PIA-M involves various process constructs such as item generation, item development and factor analysis. Instrument or scale development involves three process steps, namely, item generation, theoretical analysis and psychometric analysis, during which the researcher assesses the construct validity and reliability of the instrument scale (Morgado, Meireles, Neves, Amaral, & Ferreira, 2017). These steps will now be discussed in the context of this research.

4.4.2.1 Item generation

There are two methods to be considered in item generation, namely, deductive and inductive methods. During the latter, item development is based on opinion-based qualitative information obtained from the target research population, whilst deductive methods involve item design based on an extensive literature review and pre-existing scales (Morgado et al., 2017). According to

Morgado et al. (2017), research investigating scale development found that 35.2% of the studies reported used exclusively deductive methods, 7.6% used only inductive methods, and 56.2% combined deductive and inductive strategies. Moreover, the majority of the studies (84%) used literature review as the deductive method in item generation. In addition, 26.6% of studies that applied inductive methods chose to conduct an interview (Morgado et al., 2017). In this context, Morgado et al. (2017) found that most studies evaluate construct validity through an EFA and CFA approach. In the current research, a deductive method was applied, using a literature review (see Chapter 3), and pre-existing scale with reference to the COI (i.e. measurement of career anchor preferences). The items for the career interests and abilities subscales were self-constructed as explained in section 4.4.

The item pool should be tested, along with variables that assess closely related constructs, on a heterogeneous sample representing the entire range of the target population (Macur, Király, Maraz, Nagygyörgy, & Demetrovics, 2016). This was achieved in this study by purposive random sampling of respondents in a single research setting. Finally, in selecting scale items, the goal is internal consistency. Factor analysis was used for this purpose. Chapter 5 reports on the use of EFA to examine this aspect of the newly developed I-PIA-M.

For the purposes of measuring **career anchor preferences**, the Career Orientations Inventory (COI) (Schein, 1990) comprising 40 items was incorporated unchanged into the I-PIA-M. The COI has proven reliability and validity in the South African context as a result of Exploratory factor analysis applied by Coetzee and Schreuder (2009) to determine whether the underlying factor structure of the COI subscales resembled the hypothesised eight-factor original career anchor model obtained by Schein (1978) during a study measuring internal career orientations in the South African organisational context.

For the purposes of design method application in constructing the items for the career interests and abilities subscales, the CISS (Campbell, 2002) and SDS (Holland, 1972) were consulted. Taylor and Donnelly (2017) revisited the application of the CISS in the South African context. Respondents were assessed for various purposes including career counselling, vocational choice and personal career growth (Donnelly, 2009, 2010). In terms of reliability, internal consistency was reported in the South African context relevant to the basic scales of the CISS. The results did indicate that the constructs (Basic interests and skills dimensions) are valid on an adequate level, however, the Donnelly studies (Donnelly, 2009, 2010) hoped that a close fit would be

achieved, and thus further research in the South African environment is encouraged (Taylor & Donnelly, 2017). In terms of the SDS within the South African context, high internal consistency reliabilities have been reported, as well as good concurrent and predictive construct validity (Van Wijk & Fourie, 2017). This is supported by Zarrin, Baghban and Abedi (2011) having reported similar results during a study in Iran reporting that the mean internal consistency coefficients for the SDS was 0.86, and mean test-retest reliability for SDS subscales was high.

In terms of the career interests section of the I-PIA-M, 125 items were derived from workplace related published job information such as the Jobfile South Africa (Careers.co.za, 2006), O*NET content model (O*NET Centre, 2007; 2014) and published industry competency frameworks. Items were related to Holland's (1997) RIASEC classification framework of career interests. A similar process was followed to design the 41 abilities items of the I-PIA-M. In terms of the abilities section of the I-PIA-M, the approach followed was to analyse job related information (such as published in Job File South Africa, Careers.co.za, 2006). In addition, job related information retrieved from published industry competency repositories against job families/job groupings were analysed to supplement information derived from the Jobfile South Africa publication (Careers.co.za, 2006). Such publications include the O*NET Content Model (O*NET, 2007; 2014) apart from published competency repositories from various industries. Ability statements were derived from the said sources and related to the career abilities identified against the various model factors discussed in this chapter and in relation to the RIASEC framework for the purposes of this study in an attempt to explore alignment between the world of work in South Africa and the WWM and RIASEC framework.

In this research, a clear link was established between items and their theoretical domain. This was accomplished by beginning with a strong theoretical framework in Chapter 2 (Meta-theoretical context of the study: Contemporary organisational career development) and Chapter 3 (Career anchor preferences, career interests and abilities in the context of person–environment congruence) and employing a rigorous sorting process that matched items to construct definitions. This process was succinct and is clearly reported in this chapter (Chapter 4). Scale items relevant to career interests and abilities are presented in Appendices A and B respectively.

4.4.2.2 Theoretical analysis

The content validity of the new scale must be assessed to ensure that the initial item pool reflects the desired constructs identified during the theoretical research (Morgado et al., 2017). To promote content validity, the results of the quantitative and qualitative parts of the study captured in Chapter 5 of this research will be linked to the theoretical frameworks discussed in Chapter 3.

4.4.2.3 Psychometric analysis of the integrated I-PIA-M

The construct validity of the new scale must be assessed to ensure that the instrument measures what it is supposed to measure (Morgado et al., 2017). To promote construct validity, the results of the quantitative and qualitative parts of the study were subjected to EFA and CFA. The next section will outline the research method pertaining to the EFA and CFA, whilst the results of the construct validity will be reported in Chapter 5.

4.5 RESEARCH METHOD: PHASE 2 – ITEM EVALUATION WITH EXPLORATORY FACTOR ANALYSIS

This phase relates to empirical research aim 1

> Research aim 1 was to empirically operationalise the constructs of career anchor preferences career interests and abilities into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context

Exploratory factor analysis (EFA) is a widely used and broadly applied statistical technique in the social sciences (Strydom, 2015). EFA detects underlying factors or latent variables for a set of variables (Templin & Bradshaw, 2014) and helps the researcher to identify the number and nature of latent factors (Lee, 2014). EFA may be used as an exploratory first step during the development of a measure, and then CFA can be used as a second step to examine whether the structure identified in the EFA works. In other words, CFA can be used to confirm the factor structure identified by the EFA (Stone, 2015). Accordingly, EFA was used to determine the factor structure of the new scale items for career interests and abilities. The COI was not subjected to EFA

because of the scale's proven reliability and validity in the South African context (Coetzee & Schreuder, 2009).

4.5.1 Diagnostics tests

A Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were computed as part of the EFA. The KMO statistic is a summary of how small the partial correlations are relative to the original (zero-order) correlations (Alqahtani & Mohammad, 2015). The partial correlation for each pair of variables in the factor analysis comprises the correlation between those variables after partialling out the influence of all of the other variables in the factor analysis. If the variables share common factor(s), then the partial correlations should be small and the KMO should be close to 1.0. The KMO measure should equal 0.50 when the correlation matrix equals the partial correlation matrix. In such situations, a special case would be where the original correlation matrix is an identity matrix. As the correlation matrix approaches an identity matrix, the KMO value, as calculated by the statistical algorithms formula, approaches 0.5. The SPSS program code sets KMO to 0.50 when the correlation matrix is an identity matrix, thus avoiding the division-by-problem (Ashraf, Kadir, Pihie, & Rashid, 2014).

KMO values greater than 0.80 can be considered good, that is an indication that component or factor analysis will be useful for these variables. This usually occurs when most of the zero-order correlations are positive. KMO values of less than 0.50 occur when most of the zero-order correlations are negative. KMO values lower than 0.50 require remedial action, either by deleting the offending variables or including other variables related to the offenders. It may be that the variables reflect responses to a questionnaire where some items were written so that high scores reflected the trait in question while other items were structured so that low scores reflected the trait. In such a situation, reverse-coding the negatively worded items may remedy the low KMO value (Sinclair-Maragh, Gursoy, & Vieregge, 2015). The results of these tests are presented in Chapter 5 (Research results: Exploratory factor analysis).

4.5.2 Establishing the factor structure of the I-PIA-M

According to Pallant's (2013) guidelines, a good factor structure is evident from 40% of the cumulative variance explained. Evidence of unidimensionality (homogeneity) is represented by one factor accounting for at least 40% of the total variance. An indicator of the essential

unidimensionality of the scale is when the general factor explains more than 60% of the total variance in the factor (Wolff & Preising, 2005).

EFA was conducted on the respondent pool sample of a randomly selection of the data set (N = 100). The principal component method of extraction (maximum likelihood) and varimax rotation with Kaiser normalisation were used. Varimax rotation is by far the most orthogonal rotation, likely because it is the default in many software packages, but also because it was developed as an incremental improvement upon prior algorithms quartimax, and equamax (Osborne, 2015). The goal of rotation is to simplify and clarify the data structure (Smith, Anderson, Davenport, & Leahy, 2013). Orthogonal rotations produce factors that are uncorrelated and oblique methods allow the factors to correlate (Smith et al., 2013). The KMO value should be at least at the recommended minimum value of 0.60 (Hair, Black, Babin, & Anderson, 2010; Melnykov & Maitra, 2010), while Bartlett's test of sphericity (Bartlett, 1954; Melnykov & Maitra, 2010) should attain a statistical significance of $p = 0.000$ for the scale in order to support the factorability of the correlation matrix for the scale.

4.6 RESEARCH METHOD: PHASE 3 – CONFIRMATORY FACTOR ANALYSIS

This phase relates to empirical research aim 1

> Research aim 1 was to empirically operationalise the constructs of career anchor preferences career interests and abilities into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context.

Phase 3 of the research method involved the full data set (N = 270) to test the measurement model fit and initial structural validity of the I-PIA-M. CFA was conducted to empirically assess the structural validity of the I-PIA-M, with the objective of testing whether the data fit a hypothesised measurement model (Zhang et al., 2013).

The CFA technique fundamentally aligns with the assignment of the relationship between a construct and its indicators (Latour et al., 2011). It can be employed to validate the scale being adapted or adopted, because it is crucial that the measurement of each variable is psychometrically sound (Patrzek, Grunschel, Koenig, & Fries, 2015). Even with a fixed scale, it can still be used to approve the validity and unidimensionality (Van Diessen et al., 2015). Once

these are accepted, the findings derived from the structural model can be generally assured. Unlike EFA, CFA requires the pre-specification of all aspects of the model to be tested and is more theory-driven than data-driven.

Absolute fit indices for the CFA analysis included the chi-squared test, root mean square error of approximation (RMSEA), the standardised root-mean-square residual (SRMR), the comparative fit Index (CFI), the Akaike information criterion (AIC) and the Bentler-Bonett non-normed index (NNI). The root mean square error of approximation (RMSEA) and standardised root mean square residual (SRMR) are ≤ .10 (model acceptance) and ≤ .08 (good fit), and the comparative fit index (CFI) and Bentler-Bonett non-normed index (NNI) are ≥ .90 or higher. These absolute fit indices were determined via SAS version 9.4 (SAS, 2013). It is advised that a marginal value of RMSEA and SRMR for model acceptance is < .10 while a value of < .08 and lower is viewed as adequate for model fit (Chai & Draxler, 2014; Kline, 2011). A NNI value between .90 and .95 is perceived as marginal, above .95 is good, and below .90 is considered to be a model that has a poor fit (Bentler & Bonett, 1980; Keith, 2014). In this study CFI values close to >.90 and higher were deemed to indicate a satisfactory model fit (Keith, 2014). Low AIC values represent a marginal fit as opposed to models that fail to fit the data (Kline, 2011).

Chi-square values provide information in relation of the extent to which the observed and the predicted covariances are differentiated from one another. The smaller value of chi-square would reflect small differences between the covariance, thus indicating a better fit to the data (Schermelleh-Engel et al., 2013).

4.7 RESEARCH METHOD PHASE 4: CORRELATIONAL AND INFERENTIAL STATISTICAL ANALYSES

This phase relates to empirical research aim 1

Research aim 1 was to empirically operationalise the constructs of career anchor preferences career interests and abilities into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context.

4.7.1 Correlations

In order to evaluate the relationships among subscales of the I-PIA-M scale, product-moment correlation coefficients (also known as a Pearson *r*) were measured. The product moment correlation, *r*, is an extensively used index of effect that conveys information on both the magnitude of the relationship between variables and its direction (Ertürk & Vurgun, 2015; Nebel, Schneider, & Rey, 2016). The potential range of *r* is prominent: from -1.00 through zero (absolutely no relationship) to +1.00 (Tiernan & O'Kelly, 2014). Product-moment correlation was selected because the variables being tested were treated so as to be repeated. To the extent of evaluating practical effect size, correlations were regarded as significant at the $p = 0.001$ level, $p = 0.01$ level, and $p = 0.05$ level.

In practice, researchers often select the alpha level to be suitably low, often a probability of $p \leq 0.05$, which means there would be only a 5% chance of falsely rejecting the null hypothesis and finding that a contrast occurred when in fact there was no difference (Type I error). While a Type I error is conspicuous when the researcher accepts an effect in the sample that does not exist in the population, a Type II error occurs when the researcher fails to accept an effect or difference in the sample that does exist in the population (Kuplennik et al., 2015). Kemp, Hollowood, and Hort (2011) attempt a few approaches for minimising both Type I and Type II errors, which the researcher treated carefully in the current research.

4.7.1.1 Minimising Type I error

Type I error is essentially the rejection of the true null hypothesis. A type I error can be minimized by picking a smaller level of significance α before doing a test (requiring a smaller p-value for rejecting H0) (Garson, 2014; Heijungs, Henriksson & Guinée, 2016). In the current research, data were analysed in order to distinguish missing values, outliers and evidence of multicollinearity. When data sets are administered in an acceptable manner, errors are minimised. The number of bivariate plots and tables was investigated prior to more complex analysis.

Adjustment of a single test for each empirical research aim was achieved by decreasing the number of significance tests performed per study. In the current research, an applicable statistical technique was applied by testing each empirical research aim.

4.7.1.2 Minimising Type II error

Once the level of significance is set, the probability of a type 2 error (failing to reject a false null hypothesis) (Garson, 2014; Heijungs, Henriksson & Guinée, 2016) can be minimised either by picking a larger sample size or by choosing a "threshold" alternative value of the parameter in question that is further from the null value. This threshold alternative value is the value you assume about the parameter when computing the probability of a type 2 error. A pre-test should be carried out before beginning the research. Statistical power depends on three elements only: the size of the population the researcher considers, the size of the random sample the researcher intends to examine and the preferred statistical significance criterion. The effect size can be predicted from the related literature, or it may be determined as the minimum effect that would be of substantive concern, or the researcher may accomplish conventional values suitable to the substantive field. In the current research the significance criterion (typically 0.05 or 0.01) and the significance level of the correlation coefficients were set at $p \leq 0.05$.

The sample used in the current research was large enough to provide group and subgroup differences. The influence of detecting group differences tends to be strongest when group sizes are equal or if the overall number of subjects is fixed.

One method for maintaining control over the extraneous variables is to restrict the population studied in terms of the extraneous variables using biographical characteristics. Selecting a sample size with a large range (variance) on the independent variable will produce larger effect sizes, which will maximise the variance in the major independent variables. Hypotheses can be tested by using independent sample t-tests. One concern with this approach is the way the decision on which test to apply depends on the observed data, and how this affects the performance (Type I error rate) of the selected test. It is suggested that a t-test focus on the normality issue be chosen. The independent sample t-tests were used in the current research after the normality distribution assumption had been satisfied.

The following subsection presents the methods and parameters applied during multiple regression analysis in the current research.

4.7.2   Regression analysis

This step relates to empirical research aim 2

> Empirical research aim 2 was to assess whether race, age and gender significantly and positively predict individuals' career anchor preferences, career interests and abilities profile.

Multiple regression analysis was conducted in this research using the biographical characteristics (age, gender and race) as independent variables to estimate the percentage of variance explained by the dependent variables (subscales of the I-PIA-M scale). Multiple regression (R) is applied when two or more variables have an impact on the research; in this research age, gender and race were considered in relation to the constructs of career anchor preferences, career interests and abilities as determinants of career decision-making. Rather than analysing the research within the context of one singular variable, various variables were addressed (Nizalova & Murtazashvili, 2016). In statistics, a regression equation is used to find out what relationship, if any, exists between sets of data. This is extremely useful if the researcher wants to make predictions from the data, either future predictions or indications of past behaviour (Xu, Freeman, Cowling, & Schooling, 2013).

Button (2016) offers the following cut-off criterion for multiple regression analysis: R^2 value ≥ .01 ≤ .09 (small practical effect size); R^2 value ≥ .09 ≤ .25 (moderate practical effect size); and R^2 value ≥ .25 (large practical effect size). The significance level was accordingly set at p ≤ .05. The RSQUARE (R²) method finds subsets of independent variables that best predict a dependent variable by linear regression in the given sample.

The R^2 method requires much more computer time than the other selection methods, so a different selection method such as the STEPWISE method is a good choice when there are many independent variables to consider.

The most important statistic in terms of testing the null hypothesis is the F-statistic (Garson (2014). F is obtained by dividing the mean squares (MS) for the research group by the mean squares (MS) error (the average variance of the observations within each treatment) Garson (2014). The F value is thus the ratio of the mean regression sum of squares divided by the mean error sum of

squares. Its value will range from zero to an arbitrarily large number. The value of Prob(F) is the probability that the null hypothesis for the full model is true (i.e. that all the regression coefficients are zero). If the null hypothesis is true, it is expected that F will have a value close to 1.0 most of the time. A large F ratio means that the variation among group means is more than one would expect to see by chance Garson (2014).

The stepwise method is a modification of the forward-selection technique and differs in that variables already in the model do not necessarily stay there. As in the forward-selection method, variables are added one by one to the model, and the F statistic for a variable to be added must be significant at the level specified in the model statement. After a variable has been added, however, the stepwise method looks at all the variables already included in the model and deletes any variable that does not produce an F statistic significant at the level specified in the model. Only after this check has been made and the necessary deletions accomplished can another variable be added to the model. The stepwise process ends when none of the variables outside the model has an F statistic significance at the level specified in the model statement level and every variable in the model is significant at the level specified in the model statement, or when the variable to be added to the model is the one just deleted from it (Garson, 2014).

The backward elimination technique was applied to identify and eliminate variables that made the smallest contribution to the model statement (SAS, Inc., 2013). The backward elimination technique begins by calculating F statistics for a model, which includes all the independent variables. Then the variables are deleted from the model one by one until all the variables remaining in the model produce F statistics significant at the level specified in the model statement (or at the 0.10 level if the model statement option is omitted) (Garson, 2014). At each step, the variable showing the smallest contribution to the model is deleted.

Stepwise multiple regression analysis with backward elimination using SAS version 9.4 (SAS, Inc., 2013) was performed to test whether race, gender and age significantly predicted the career anchor preferences, career interests and abilities of individuals.

4.7.3   Tests for mean differences

This phase relates to empirical research aim 3

Empirical research aim 3 was to explore whether individuals from various race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities.

Tests for significant mean differences will be conducted to assess such differences in the various subdimensions of the scale for age, gender and race groups.

When using the independent-samples t-test the value should be above 0.05 to indicate that there is no significant difference between the various groups. If the value is equal to or less than 0.05 there is a significant difference in the mean scores for each of the groups. When conducting analysis of variance (ANOVA), an F-ratio is calculated that indicates the variance between the groups, divided by the variance within the groups. A significant F-test indicates that the null hypothesis can be rejected since there is more variability between the groups than there is within the groups. In terms of statistical significance, if the significance level is less than or equal to 0.05, then there is a significant difference among the mean scores on the dependent variable for the different groups (Pallant, 2013). Subsequently, Cohen's d value was used to report the practical effect size and will be interpreted as $d = .20$ (small effect); $d = .50$ (medium effect); and $d = .80$ (large effect) (Cohen, 1992).

The test for mean difference was applied using the independent samples t-test. Based on the analysis of sample (N=270) data, age comprised four subgroups, gender two subgroups and race comprised four subgroups. The groups and subgroups are presented in table 4.1. The independent samples t-test compares the mean scores of the groups in a given variable, that is, more than on mean score of the same variable, where one mean represents the average of that characteristic for one group and the other mean represents the average of that specific characteristic in the other groups (Soylu et al., 2013). The independent samples t-test compares one measured characteristic between two or more groups of observations or measurements. It shows whether the difference between the independent samples is a true difference or whether it is just a random effect (statistical artefact) caused by skewed sampling. The independent samples t-test is also called an unpaired t-test and is the t-test to use when two separate independent and

identically distributed variables are measured (Fukunaga et al., 2012). Independent samples are easiest to obtain when selecting the participants using random sampling. The independent samples t-test is similar to the dependent sample t-test, which compares the mean score of paired observations. These are typically obtained when either re-testing or conducting repeated measurements, or when grouping similar participants in a treatment-control study to account for differences in baseline. However, the pairing information needs to be present in the sample and therefore a paired sample can always be analysed using an independent samples t-test but not the other way around (Wang, Wang, Chen, Kinchla, & Nugen, 2016).

The significance cut-off level was set at $p \leq 0.05$. Table 4.3 presents a summary of levels of significance for statistical techniques used in inter-correlation, multiple regression analysis, the test for distribution normality and the tests for significant mean differences.

Table 4.3

Summary of Levels of Significance for Statistical Techniques used in Multiple Regression Analysis, Test for Distribution Normality and Test for Significant Mean Differences

Measure/procedure	Levels of significance	Source
Multiple regression	• F-test of the significance of the interaction of the two variables is the significance of the change of R-square of the equation at $p \leq .05$.	Garson (2014).
Test for distribution normality	Significance level $p \leq .05$ (non-normal distribution) Significance level $p > .05$ (normal distribution)	Ghasemi & Zahediasl (2012)
Test for significant mean difference	Significance level $p \leq .05$ Cohen's d: *d* value 0.2 (small standardised practical effect size) *d* value 0.5 (medium or moderate practical effect) *d* value 0.8 (large practical effect)	Cohen (1992) Heijungs, Henriksson & Guinée (2016);

The next section explains the different types of validity that were applied in the current research to ensure a valid I-PIA-M scale and valid research findings.

4.7.4   Scale validity and reliability

This step relates to empirical research aim 1.

> Research aim 1 was to empirically operationalise the constructs of career anchor preferences career interests and abilities into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context.

Scale validity and reliability are important for the purposes of statistical analysis. In the context of this research, construct validity, discriminant and convergent validity, and reliability will be discussed. The results of the relevant statistical analyses relevant to this research will be discussed in Chapter 5.

4.7.4.1 Construct validity

Construct validity defines how well a test or experiment measures up to its claims (Saraiva et al., 2013) and is one of the most important concepts in social research. It is the core of any study in which researchers use a measure as an index of a variable that is not itself directly observable (e.g. happiness, locus of control, optimism). If a test lacks construct validity, results obtained using this test or procedure will be difficult to interpret (Malinowsky & Larsson-Lund, 2016). Construct validity is established by presenting correlations between a measure of a construct and a number of other measures that should, theoretically, be associated with it (convergent validity) or vary independently of it (discriminant validity). The aim of construct validation is to enclose a professed measure to establish its relationship to other variables with which it should, theoretically, be associated positively, negatively, or practically not at all (Woo et al., 2016).

Construct validity is closely linked to the concept of a nomological network specifying the relationships among a number of constructs. However, locating a construct within such a nomological network by means of investigations of discriminant validity is very trying, since a large number of relationships have to be considered. In contrast, the investigation of convergent validity is far more focused than the investigation of discriminant validity, and as a consequence, convergent validity can be achieved in a more straightforward way (Warren et al., 2016).

4.7.4.2 Discriminant and convergent validity

Discriminant validity is a property that scales are expected to show. A scale showing this property has been proven not to correlate with scales representing constructs that are regarded as unrelated to the construct that is represented by this scale (Ogara et al., 2014). Discrimination is an important characteristic of an innovation in personality assessment, since a dimension of personality is hypothesised. When a construct is proposed, the proponent invariably has in mind distinctions between the new dimensions and other constructs already in use. Discriminant validity is rarely considered in isolation and usually not classified as one of the major types of validity, as it generally appears in combination with convergent validity (Maatoug et al., 2016).

Convergent validity is a type of validity that is determined by hypothesising and examining the overlap between two or more tests that presumably measure the same construct (Lysaght, 2015). Convergent validity is used to evaluate the degree to which two or more measures that should theoretically be related to each other are, in fact, observed to be related to each other (Luedtke & Van der Laan, 2016). Convergent and discriminant validity are also two important aspects of construct validity.

It is recommended that future cross-validation studies of the I-PIA-M be carried out to investigate this aspect of the I-PIA-M. The current study evaluated the structural validity of the I-PIA-M and the way in which convergent and discriminant validity manifested in terms of the structure that emerged from the CFA analysis.

4.7.4.3 Reliability

Validation requires the evaluation of the proposed interpretations and uses of test scores based on all available evidence (Cronbach, 1988; Messick 1989) and therefore requires a clear statement of what is being proposed. To say that a score interpretation or use is valid is to say that the interpretive argument is coherent (in the sense that reasoning leading from the score to the conclusions hangs together) and that its inferences and assumptions are plausible. The validity argument provides an overall evaluation of the proposed interpretation and uses of test scores, and of any plausible alternative interpretations or uses of the scores (Cronbach, 1988). A serious validation effort involves a critical evaluation of all inferences and assumptions in the interpretive argument (Kane, 2011).

Alpha was developed by Lee Cronbach in 1951 to provide a measure of the internal consistency reliability of a test or scale; it is expressed as a number between 0 and 1. Internal consistency describes the extent to which all the items in a test measure the same concept or construct and, hence, it is connected to the interrelatedness of the items within the test. To ensure validity, internal consistency reliability should be determined before a test can be employed for research or examination purposes (Tavakol & Dennick, 2011). In addition, reliability estimates show the amount of measurement error in a test. Put simply, this interpretation of reliability is the correlation of a test with itself. Squaring this correlation and subtracting it from 1.00 produces the index of measurement error (Tavakol & Dennick, 2011). Reports on the acceptable values of alpha differ, ranging from 0.70 to 0.95. A low value of alpha could be due to a low number of questions, poor interrelatedness between items or heterogeneous constructs. For example, if a low alpha is due to poor correlation between items then some should be revised or discarded. The easiest method to identify such items is to compute the correlation of each test item with the total score test; items with low correlations (approaching zero) are the deleted. If the alpha is too high, it may suggest that some items are redundant as they are testing the same question but in a different guise. Internal consistency reliability coefficients (> 0.70) for the various subscale dimensions will be considered and reported on in Chapter 5.

4.8 RESEARCH METHOD: PHASE 5 – QUALITATIVE STUDY (APPLICATION OF THE I-PIA-M)

This phase relates to empirical research aim 4

> Empirical research aim 4 was to apply the empirically validated integrated career anchor preferences, career interests and abilities congruence scale (I-PIA-M) in practice to assess individual–organisational career path congruence

Various strategies were employed to ensure the crystallisation of individual–organisational career path congruence in each case.

4.8.1   Credibility

Credibility refers to how well the researcher's portrayal of participants matches the participants' perceptions (Bloomberg & Volpe, 2008). Typically, concurrent triangulation strategy in mixed methods is an approach in which the researcher collects both quantitative and qualitative data concurrently and then compares the two databases to determine whether there is convergence, differences, or some combination of the two (Cresswell, 2014 De Lisle, 2011; Terrell, 2012). According to Terrell (2012), in the triangulation of data, the data are be collected using multiple sources that include interviews, observations and document analysis.

According to Yilmaz (2013) and Cresswell (2014), triangulation or a combination of interviewing, observation and document analysis contributes to a rigorous qualitative research study. Five types of triangulation enhance the verification of qualitative analysis, adding depth and breadth to understanding the issue under investigation. These are methods triangulation, sources triangulation, analyst triangulation, theory/perspective triangulation and methodological triangulation, all of which together enable the researcher to gain a broader and deeper understanding of the research issue (Creswell, 2009; Denzin & Lincoln, 1994; Patton, 2002). Different sources of information are triangulated by examining evidence from the sources and using it to build a coherent justification for themes. If themes are established based on the convergence of several sources of data or perspectives from participants, then this process can be claimed to add to the validity of the study (Cresswell, 2014).

In the context of this study, qualitative data were collected by requesting an identified target group of respondents to complete the I-PIA-M, followed up with interviews aligned to the career construction approach in which various life story themes were identified. This was followed by an integration of data obtained from the I-PIA-M and career construction-based interviews and related back to the theory. The purpose was to support the findings of the quantitative study through the application of a triangular qualitative study approach.

4.8.2   Transferability

Transferability is achieved if the findings of a qualitative study are transferable to other similar settings. In this regard, a thick description of the setting, context, people, actions, and events studied is needed to ensure transferability or external validity in quantitative terms (Yilmaz, 2013). Transferability is about the degree to which the study has made it possible for the reader to apply

the findings in the situations investigated to other similar situations (Bloomberg & Volpe, 2008; Lincoln & Guba, 1985). It is also important to report all evidence systematically in order for the reader to confirm whether the findings flow from the data and experiences rather than from the bias and subjectivity of the researcher. Finally, transferability is about the degree to which the study has made it possible for the reader to apply the findings in the situations investigated to other similar situations (Bloomberg & Volpe, 2008; Lincoln & Guba, 1985).

4.8.3 Confirmability

A study enjoys confirmability when its findings are based on the analysis of the collected data and examined via an auditing process; that is, the researcher confirms that the study findings are grounded in the data and inferences based on the data are logical and have clarity, high utility or explanatory power (Yilmaz, 2013).

4.8.4 Dependability

A study has dependability (reliability) if the process for selecting, justifying and applying the research strategies, procedures and methods is clearly explained and its effectiveness evaluated by the researcher and confirmed by a research auditor, which is referred to an 'audit trail' (Yilmaz, 2013). Dependability rests on the quality of the data collection and analysis (Lincoln & Guba, 1985) and is shown by explaining that the research systematically studied what it claimed to study (Miles & Huberman, 1994).

4.8.5 Trustworthiness of data

For a qualitative study to be credible and trustworthy, the data must first and foremost be sufficiently descriptive and include a great deal of pure description of people, activities, interactions and settings so that the reader or reviewer can understand what occurred and how it occurred (Yilmaz, 2013). The basic criterion for judging the credibility of data is the extent to which they allow the reader to enter the situation or setting under study. In other words, a rich and detailed or thick description of the setting and participants is a must. According to Yilmaz (2013), the researcher must provide an accurate picture of the empirical social world as it exists to those under investigation, rather than as the researcher imagines it to be. The descriptions must be factual, accurate and detailed but without being overburdened with irrelevant information or trivia. In addition, researchers should overtly reveal the biases they bring to the study and discuss how

their background, including gender, ethnicity, disciplinary orientation and ideological viewpoint, affected the interpretation of the findings (Yilmaz, 2013).

4.8.6 Triangulation and crystallisation

Qualitative credibility, on the other hand, is achieved through practices that include thick description, triangulation or crystallisation, and multivocality and partiality (Tracy, 2010). Triangulation and crystallisation are two practices that align in craft but differ in paradigmatic motivation (Tracy, 2010). Similar to the way multiple pieces of data ease geographical navigation, triangulation in qualitative research implies that findings may be judged valid "when different and contrasting methods of data collection yield identical findings on the same research subjects; a case of replication within the same setting" (Bloor, 2001, p. 384).

Triangulation is a method used by qualitative researchers to check and establish validity in their studies by analysing a research question from multiple perspectives (Guion, Diehl, & McDonald, 2011). In the context of this study, data triangulation and methodological triangulation are of importance. Data triangulation involves using different sources of information to increase the validity of the study (Guion et al., 2011), while methodological triangulation involves the use of multiple qualitative and/or quantitative methods to study the phenomenon (Guion et al., 2011).

Crystallisation is a framework for conducting qualitative and multimethod research that offers significant potential for enriching the relationship research (Ellingson, 2014). Richardson (2000) proposes the crystal as a "central imaginary" that transcended the "rigid, fixed, two-dimensional" (p. 934) triangle. She explains that a crystal

> … combines symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach. Crystals grow, change, alter, but are not amorphous. Crystals are prisms that reflect externalities and refract within themselves, creating different colors, patterns, and arrays, casting off in different directions. What we see depends upon our angle of repose (Richardson, 2000, p. 934).

Crystallisation encourages researchers to gather multiple types of data and employ various methods, multiple researchers and numerous theoretical frameworks (Tracy, 2010). However, it assumes that the goal of doing so is not to provide researchers with a more valid singular truth, but to open up a more complex, in-depth, but still thoroughly partial, understanding of the issue (Tracy, 2010). According to Ellingson (2014), crystallisation holds two benefits for qualitative

research, namely, a crystallisation framework retains the conventional report genre and enhances it with accounts whose narrative, poetic, or aesthetic sensibilities provide complementary insights. In addition, the use of crystallisation is especially beneficial for relationship research precisely because of the focus on the complex dynamics of everyday relating, processes that are difficult to appreciate fully without the use of visual media or storytelling practices.

Crystallisation produces knowledge about a phenomenon by generating a deepened, complex interpretation, thereby supporting the notion for research to provide an in-depth understanding of topics (Ellingson, 2014). In the context of this study it is critical for the qualitative research to provide an in-depth understanding of the relationship between career anchor preferences, career interests and abilities in the context of person–career path congruence. Crystallisation utilises forms of analysis or ways of producing knowledge across multiple points of the qualitative continuum, generally including at least one middle-ground (constructivist) or middle-to-right (postpositivist) analytic method and one narrative, visual, performative, or other creative approach. In this way, crystallisation challenges the widely accepted belief that researchers must forsake the rigor of social science for the holism of narrative or vice versa (Ellingson, 2014).

In the context of this research, data pertaining to the I-PIA-M were carefully analysed to identify patterns related to career anchor preferences, career interests and abilities among the qualitative respondent pool. Through the application of the career construction interview, themes were identified and related back to the I-PIA-M outcomes, in the context of the contemporary work environment (as defined by models such as Holland's theory, O*NET, WWM and OFO), resulting in integrated career profiles in the context of the contemporary work environment.

4.8.7   Intervention

The qualitative intervention involved the steps presented in Figure 4.3.
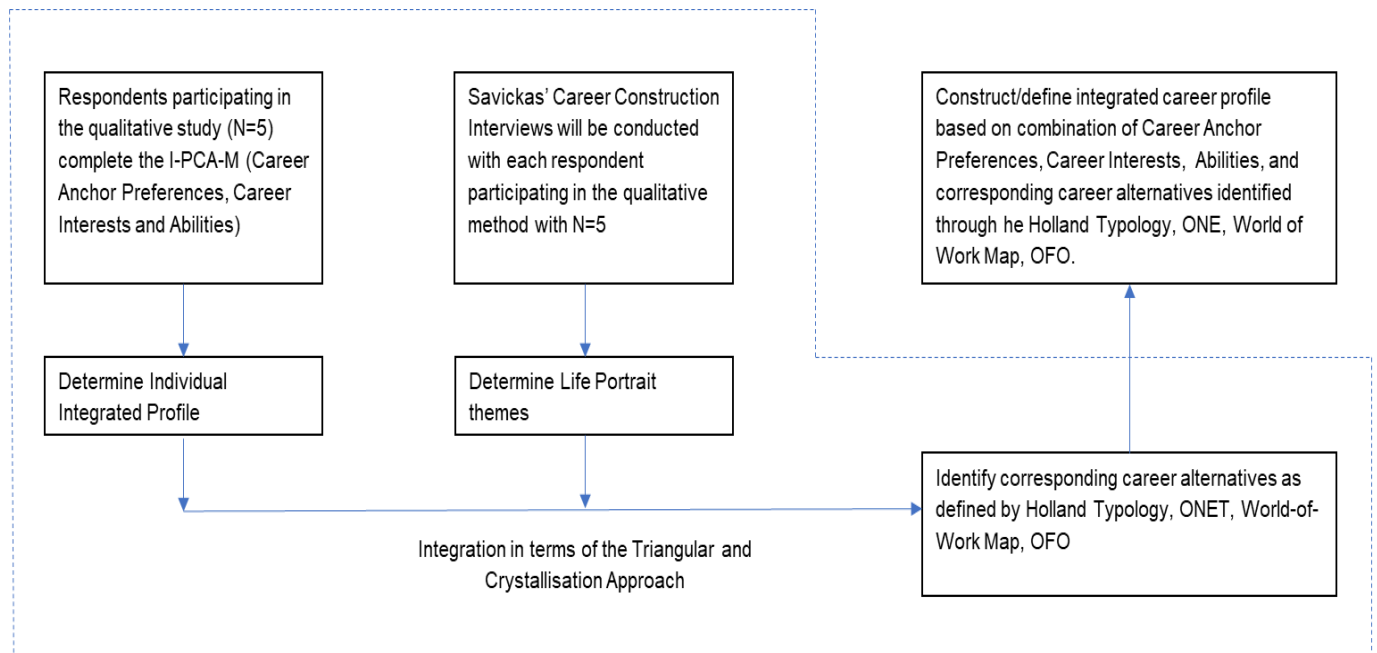
Figure 4.3 Steps in the qualitative intervention

The steps in the qualitative intervention were applied as follows:

- Respondents were requested to complete the I-PIA-M (Career Anchor Preferences, Career Interests and Abilities Measure). Profiles were analysed to determine their career interests and abilities in the context of the remaining factors identified during the quantitative study based on the EFA process. In addition, the IDEAS was completed by the case study to verify I-PIA-M results in terms of RIASEC correspondence.

- A one-and and-half-hour career construction interview (CCI) (Savickas, 2005) was conducted with each participant to determine career life story themes. Based on the career construction theory (Savickas, 2005) the CCI represents a contextualised approach to career counselling and sssesses what client say/do rather than counting responses to an inventory/test (Barclay, 2012). It is applied in the form of a semi-structured interview that that "helps to elucidate a client's story and identify career themes (Savickas, 2011).

- The results of the I-PIA-M (career anchor preferences, career interests and abilities) and the life story themes were integrated to produce an integrated individual profile for each participant.

- The career orientations inventory (COI) was administered to measure career anchor preferences as part of the I-PIA-M. According to Schein (1990), regardless of one's current job or career, future decisions will be easier and more valid if there is a clear understanding

of one's own preferred orientation to work, motives, values, and self-perceived talents. In the present study the term "career anchor preferences" is adopted to refer to the preferred or dominant career orientations as measured by Schein's (1997) career orientations inventory.

- Career interests and abilities criteria in terms of Holland personality and occupational types (RIASEC), O*NET, WWM were applied to serve as the requirements of the contemporary world of work.

- Individual integrated career profiles of respondents were related to the contemporary world of work requirements to determine the level of congruence obtained between individual career anchor preferences, career interests and abilities, and contemporary world of work requirements. The purpose of this step was to validate the level of congruence between an individual's career anchor preferences, career interests and abilities, and their career path requirements.

4.8.8 Data analysis

The data analysis strategy comprised a two-pronged approach: analysis in terms of test construction, and validation in terms of the quantitative and qualitative data related to respondents.

The following steps were followed in the EFA of the subscales (Career interests and Abilities):

- A KMO test for sampling adequacy and Bartlett's test of sphericity were conducted to confirm that the data were suitable for factor analysis.
- Principal component factoring, using varimax rotation with Kaiser normalisation as extraction methods, were used to determine the underlying factors of each subscale.
- Testing for common method bias and construct validity of the retained factor solution of scales was done.

The next step was to test the internal consistency reliability and the construct validity of the three subscales (career anchor preferences, career interests and abilities) of the I-PIA-M by means of CFA. Validity was analysed in terms of the construct validity, convergent validity and discriminant validity of all three validity types important for data analysis in a research project of this nature (DeVellis, 2016).

206

Descriptive statistics and bi-variate correlations were then calculated and analysed. Further, means and standard deviations were calculated, and biographical variables as predictors of career anchor preferences, career interests and abilities were analysed by applying the stepwise regression analysis method. Tests for significant mean differences in terms of race, gender and age were calculated.

The results related to the qualitative data analysis strategy will be discussed in Chapter 5.

The data analysis strategy appropriate to qualitative data involved applying the theoretical principles relevant to the various theoretical frameworks discussed in Chapter 3. In terms of these principles, the following strategy was applied:

- Analysis of responses to the I-PIA-M for the five respondents included in the qualitative study to establish the three highest scores on career anchor preferences (establishing primary, secondary and tertiary anchor preferences based on Schein's (1990) career anchor theory).

- Analysis of responses on the I-PIA-M for the five respondents included in the qualitative study to establish the three highest scores on career interests (establishing the three-letter code for each respondent based on Holland's (1997) RIASEC framework)

- Analysis of responses on the I-PIA-M for the five respondents included in the qualitative study to establish the highest scores on abilities (establishing the highest scores based on score above average on a 6-point scale, considering scores of ≥ 3)

- Analysis of responses recorded in the career construction interview for the five respondents included in the qualitative study to establish the highest scores on abilities (establishing the most prominent career life themes). In alignment with Savickas (2005) theory, career life themes were identified by integrating the overall outcomes of the structured career construction interview.

- The results of all the above were mapped onto the career anchor preferences, career interests and abilities constructs (and related labels as discussed in Chapter 3) measured by the I-PIA-M to provide an integrated alignment between the results of the qualitative study, the I-PIA-M constructs and the theoretical underlying constructs.

- The results of the integrated alignment scores (as discussed above) were mapped onto the career path frameworks (as discussed in Chapter 2) to predict current and future person–career path congruence/alignment.

The results of the qualitative data analysis strategy will be discussed in Chapter 6.

4.8.9 Ethical issues relevant to qualitative research

As stated in Chapter 1, research ethics forms a critical factor when conducting research. Rosenthal and Rosnow (2009) define research ethics as the minimum standards of moral principles that govern the behaviour of researchers. These include compliance with the social and professional obligations the researcher has with regard to the research participants and participating organisations.

Ethical challenges in qualitative research include a focus on confidentiality, and ensuring that the tools and techniques applied are valid and reliable, and are sensitive in accommodating and protecting individual/personal information, obtaining consent from participants if an interview technique is applied, as well as identifying and addressing risks in the research process. In addition, the interpretation of the results of quantitative research should be validated by their generalisability and objectivity (Dongre & Sankaran, 2016). Researchers should also be aware of their own impact on interpretations of what is shared by respondents and thus manage the relationship between counsellor and respondent in an effective manner (Jelsma & Clow, 2005). During interviews it is important that researchers consider benefits and harm that may be caused by the outcomes of the research (Orb, Eisenhauer, & Wynaden, 2000).

With due consideration of the overall ethical considerations for this research outlined in Chapter 1, and the challenges mentioned above, the following ethical considerations relevant to qualitative research were adhered to:

- Getting informed consent from research participants
- Maintaining utmost confidentiality of results
- Ensuring the maximum practical level of anonymity of participants
- Informing participants about the reasons for, and results of, the research.
- Strictly applying the principles of the career construction interview as defined by Savickas (2005)
- Generalisation of outcomes against the constructs measured in terms of the literature study and the empirical study
- Respondents' anonymity was protected when reporting and commenting on results.

4.9 RESEARCH HYPOTHESES AND PROPOSITIONS: QUANTITATIVE AND QUALITATIVE RESEARCH

Table 4.4 summarises the empirical research aims, the research hypotheses, propositions and quantitative (statistical) and qualitative procedures used to achieve the research aims.

Table 4.4

Summary of Empirical Research Aims, Research Hypotheses, Propositions and Empirical Procedures

Research aim	Research hypothesis and propositions	Empirical procedure
Quantitative study	**Research hypothesis**	
Research aim 1: To empirically operationalise the constructs of preferences, career interests and abilities into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context. *Sub-aim 1.1*: To determine the psychometric properties (reliability and validity) of the integrated career anchor preferences, career interests and abilities congruence scale of the newly developed I-PIA-M. *Sub-aim 1.2*: To ascertain the nature of the interrelationships between the subscale dimensions of the newly developed I-PIA-M.	H1: The elements of the theoretical framework for positive coping behaviour can be operationalised into a valid and reliable I-PIA-M.	Exploratory factor analysis Reliability analysis Correlations Confirmatory factor analysis
Research aim 2: To assess whether race, age and gender significantly and positively predict individuals' career anchor preferences, career interests and abilities profile.	H3: Race, age and gender significantly predict individuals' career preferences, career interests and abilities.	Stepwise regression analyses
Research aim 3: To explore whether individuals from various race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities.	H4 Individuals from various race, gender and age groups differ significantly regarding their career preferences, career interests and abilities.	Independent samples t-test
Qualitative study	**Research propositions**	
Research aim 4: To apply the empirically validated integrated career anchor preferences, career interests and abilities congruence scale (I-PIA-M) in practice to assess individual–organisational career path congruence.	1. Individuals attach various meanings to their perceptions of their career interests which manifest as core themes influencing person–organisational career path congruence 2. Individuals attach various meanings to their perceptions of their abilities which manifest as	Qualitative data analysis strategies relevant to explorative, descriptive case study based on an interpretivist paradigm.

	core themes influencing person–organisational career path congruence. 3. Individuals attach various meanings to their perceptions of their career anchor preferences which manifest as core themes influencing person–organisational career path congruence. 4. Individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences which manifest as core themes influencing person–organisational career path congruence. 5. Individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences (as measured by the I-PIA-M), and their career anchor preferences and career interests elicited from the career construction interview which manifest as core life themes influencing person–organisational career path congruence	
Research aim 5: To formulate conclusions, limitations and recommendations on person–organisation career path congruence career psychology-related practices and future research.	N/A	Formulate conclusions, limitations and recommendations for future research.

4.10   CHAPTER SUMMARY

This chapter sought to explain the research methodology applied. The research followed a mixed-method approach, involving both a quantitative and a qualitative design. The participants comprised a random sample of distance learning students (N = 270) who were registered for undergraduate studies in the economic and management sciences fields at a South African higher education open distance learning institution for a particular year. Purposive sampling was used to recruit the participants for the qualitative study.

The chapter outlined the six steps of scale development that were applied in designing the I-PIA-M. Item generation, theoretical analysis and psychometric analysis were applied as steps in the design of the I-PIA-M.

The research method was discussed in terms of diagnostic tests, establishing the factor structure of the I-PIA-M (the latter established through EFA), CFA, and correlational and inferential statistical analysis. The research method, including correlations, stepwise regression analysis, test for mean differences and the methods and sub-steps, was discussed in more detail. In addition, scale validity and reliability were discussed in relation to construct validity, discriminant

and convergent validity, and reliability. Owing to the use of the mixed research approach, the chapter also provided more clarity on the research method relevant to the qualitative study. The data analysis strategy for both the quantitative and the qualitative study design was defined in order to lay the foundation for the subsequent data analyses and results to be reported in Chapter 5 (quantitative focus) and Chapter 6 (qualitative study).

The next chapter (Chapter 5: Research results: quantitative study) will describe and explain the quantitative research results of the empirical study. This will be followed by Chapter 6, which describes and explains the qualitative results of the empirical study.

CHAPTER 5

RESEARCH RESULTS: QUANTITATIVE STUDY

The current study is exploratory in nature and focused on the development of a new scale (Integrated Career Anchor Preferences, Career Interests, and Abilities Measure – I-PIA-M) for the measurement of individuals' career anchor preferences, career interests and abilities for career path congruence guidance. The literature chapters gave insight into the theoretical frameworks and subdimensions of the I-PIA-M, including the items generated for each subscale. This chapter discusses the statistical procedures performed to explore the factorial validity, unidimensionality and structural validity of the I-PIA-M.

5.1 EMPIRICAL RESEARCH AIM 1

Research aim 1 was to empirically operationalise the constructs of career anchor preferences career interests and abilities into an integrated empirical measurement scale to guide individual– organisational career path congruence in the South African organisational context.

The following research hypothesis was tested to achieve research aim 1:

H1: The elements of the theoretical framework for career anchor preferences, career interests and abilities can be operationalised into a valid and reliable I-PIA-M.

Statistical analysis was conducted in two stages:

Stage 1: Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to assess the factorial and structural validity and reliability of the newly developed scale. This stage addressed the following research sub-aim:

Sub-aim 1.1: To determine the psychometric properties (reliability and validity) of the integrated career anchor preferences, career interests and abilities congruence scale of the newly developed I-PIA-M.

Stage 2: This stage involved exploring the magnitude and direction of the correlations between the subscale variables of the I-PIA-M best fit model. This stage addressed the following research sub-aim:

Sub-aim 1.2: To ascertain the nature of the interrelationships between the subscale dimensions of the newly developed I-PIA-M.

5.2 STAGE 1: EXPLORATORY FACTOR ANALYSIS

This section reports on the results of the EFA of the following two subscales of the I-PIA-M:

- Career interests
- Abilities

The EFA was applied to a randomly selected sub-set of the data (n = 100).

Note: Because the eight-factor solution of the Career Orientations Inventory (COI) developed by Schein (1990; 2006) has been widely tested in South Africa for its reliability and validity, it was decided not to subject this subscale (career anchor preferences) aspect of the I-PIA-M to an EFA. Instead, a Harman's one-factor solution was computed which indicated that only 7.5% of career anchor preferences is explained by an overall factor. This result indicates that the COI had a multifactor structure and that common method bias was not a serious threat to the findings regarding the COI.

The following steps were followed in the EFA of the subscales (career interests and abilities):

- A Kaiser-Meyer-Olkin (KMO) test for sampling adequacy and Bartlett's test for sphericity were conducted in order to confirm that the data were suitable for factor analysis.
- Principal component factoring, using varimax rotation with Kaiser normalisation as extraction methods, were used to determine the underlying factors of each subscale.
- Testing was done for common method bias and the construct validity of the retained factor solution of scales.

5.2.1 EFA results: Career interests

The questionnaire included 199 items related to a list of career paths and/or areas of work available within an organisation and/or industry. For the purposes of this study, career fields of interest measured by the career interests subscale related to:

(1) Activity Driven (45 items);

(2) People Oriented (14 items);

(3) Environment Driven (20 items);

(4) Business Careers (31 items);

(5) Customer Support Services (27 items);

(6) Financial/Numerical Related Services (26 items);

(7) Scientific Orientation (17 items);

(8) Administrative service (10 items); and

(9) Information Technology (9 items).

Initially, prior to the EFA analysis, various items intended to measure multiple dimensions, with 10 items measuring three dimensions, 54 items measuring two dimensions and 61 items measuring one dimension.

All items were rated using a Likert-type scale with six response categories, ranging from "Strongly Dislike (1)", "Dislike (2)", "Slightly Dislike (3)", "Slightly like (4)', "Like (5)", to "Strongly Like (6)".

At the outset, a Harman's one-factor solution was computed which indicated that only 35.57% of career interests was explained by an overall factor. This result indicated that the career interests subscale had a multifactor structure and that common method bias was not a serious threat to the findings regarding this subscale of the I-PIA-M. An EFA was subsequently computed to ascertain the factor structure of the Career Interests subscale.

Statistical data for the 199-item overall career interest profile scale suggested good sampling adequacy, having reported a score of 0.87 in terms of the KMO measure of sampling adequacy (values between 0.8 and 1 indicate that the sampling is adequate). Significance in terms of Bartlett's test for sphericity was used to assess the suitability of the data for factor analysis. Since the significance was found to be $p = .00$, the data were suitable for factor analysis.

Table 5.1 presents the results on the KMO measure of sampling adequacy, and Bartlett's test of sphericity.

Table 5.1

Results on the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, and Bartlett's Test of Sphericity: Career Interest Subscale

Kaiser-Meyer-Olkin measure of sampling adequacy.		.87
Bartlett's test of sphericity	Approx. chi-square	27069.34
	df	7750
	Sig.	.00

Twenty-two factors with an eigenvalue greater than 1 are visible in Table 5.2. Owing to the large number of factors, a rigorous cut-off (eigenvalue 2.00) was chosen. These factors were subjected to further rotation.

Table 5.2 further shows that the multidimensionality of the I-PIA-M could be ascribed to the presence of a general factor. Overall, when considering all nine factors in Table 5.2, 63.78% of the variance was explained; this is close to the 60% variance explained by the threshold for evidence of essential unidimensionality (an underlying general factor).

Any given item was considered to belong to a particular factor if it had a factor loading of .50 or higher because of the factors loading strongly onto an overall factor. Theoretical expectations and the contents of factors and items were considered when decisions either to include or omit items were not clear-cut. The EFA focused on discovering an underlying (simple) structure and not on determining it. The purpose of the EFA was seen as helping to explore whether the nine theoretically proposed factors could be reliably identified and to conduct further statistical analyses. The EFA assisted in removing problematic items and identifying the factor on which the item had a better loading. Table 5.2 shows that nine factors were retained following the EFA.

Table 5.2

Factor Extraction using Principal Component Analysis (Career Interests)

	Initial Eigenvalues			Rotation Method: Varimax
Factor	Total	Difference	Cumulative	Variance explained
1	38.56	27.42	0.31	16.13
2	11.14	3.10	0.40	14.47
3	8.04	1.00	0.46	13.53
4	7.04	2.54	0.52	7.32
5	4.51	0.89	0.55	7.28
6	3.61	0.83	0.58	5.05
7	2.78	0.31	0.61	3.90
8	2.47	0.42	0.63	3.55
9	2.05	0.26	0.64	2.84
10	1.78	0.08	0.66	2.56
11	1.70	0.07	0.67	2.43
12	1.63	0.06	0.68	2.22
13	1.57	0.11	0.70	2.10
14	1.47	0.03	0.71	2.02
15	1.44	0.02	0.72	1.85
16	1.42	0.14	0.73	1.76
17	1.29	0.07	0.74	1.69
18	1.22	0.03	0.75	1.59
19	1.19	0.07	0.76	1.55
20	1.12	0.05	0.77	1.53
21	1.07	0.01	0.78	1.48
22	1.05	0.09	0.79	1.31

Note: n = 100

A summary of the rotated factor pattern on the Career Interests subscale, reflecting the unique variance each factor contributes to the variance of the observed variable, is presented in Appendix C.

Table 5.3

Summary of Extracted Factors: Career Interests

Factor	Label	Description and focus	Number of items
1	Information Technology and Scientific orientation	Information Technology and scientific orientation (related to investigative (I) and realistic (R))– People interested in a career involving Computers or Information technology, have the need to work with complex data in either raw or final format. Typically, they are well organized individuals with well-developed analytical and problem-solving skills. People interested in a career in the Sciences have an investigative mind, approaching matters and issues from a scientific perspective, with well-developed analytical and problem-solving skills and an eye for detail. They have the need to collect, collate data, analyse it, interpret and report on findings, providing others with their valuable conclusions. They tend to apply logical thinking in a more informal, yet procedure-controlled environment.	20
2	Financial/ numerical	People interested in a career involving finances/working with numbers, have the need to work with figures, making simple and complex calculations in solving problems of a various nature. Typically, they are well organized individuals with well-developed analytical and problem-solving skills and an eye for detail. In order to succeed in this field of work an	20

		above average ability in Mathematics is required.	
3	Business careers	Business careers involve managing a business, project or production processes, and developing and implementing business processes and plans. Advertising, marketing and the sale of goods and/or services to customers are included in this career field. It often involves managing, motivating and leading staff.	18
4	People oriented	Careers involve working with, communicating with, and teaching people. These occupations often involve helping or providing service to others.	10
5	Administrative service	Supporting business operations by delivering routine, complex and specialised administrative duties in accordance with predefined processes and procedures	11
6	Customer support	Customer support involves helping customers efficiently, in a friendly manner. It is the act of taking care of the customer's needs by providing and delivering professional, helpful, high quality service and assistance before, during, and after the customer's requirements are met.	5
7	Environment driven	Work environment preferences include various factors. Such factors include the preference for outdoors (the need to work in the open air and typically will not pursue careers that requires office bound	6

		activities), indoors (the need to work within a building and typically will pursue careers involving office bound activities), formal (the need to work in high disciplined environments governed by rules and regulations and where high emphasis is placed on image, formal dress codes and ceremonies) or informal (the need to conduct daily activities in a more flexible and relaxed manner without jeopardizing quality of service and/or products).	
8	Activity driven	Physical activities are performed, often equipment and vehicles are operated/controlled, and complex/technical activities are accomplished as job outputs.	3
9	Environment driven: Legal	Legal professionals study, develop and apply law. In a corporate context, the focus of the legal professional is to determine and ensure that all business practices, policies and procedures meet regulatory requirements, and to advise the business on how to protect legal interests.	3
TOTAL			96

In summary, the EFA confirmed the multidimensionality of the Career Interest Subscale of the I-PIA-M. The original Career Interests Subscale of the I-PIA-M contained 199 items, of which 103 were removed, leaving 96 items to be used in further statistical analysis. The nine factors were relabelled as shown in Table 5.3.

5.2.2 EFA results: Abilities

The I-PIA-M ability section design included 46 items related to a list of workplace abilities associated with various career fields in an organisation and/or industry. For the purposes of this study, perceived abilities measured by the Abilities subscale of the I-PIA-M related to:

(1) Verbal Ability (6 items);

(2) Numerical Ability (6 items);

(3) Abstract Reasoning (5 items);

(4) Technical Ability (3 items);

(5) Managing Others (12 items);

(6) Business Acumen (3 items);

(7) Inspiring and Leading Others (6 items); and

(8) Resilience (5 items).

Initially, prior to the EFA analysis, various items intended to measure multiple dimensions, with 4 items measuring two dimensions and 38 items measuring one dimension.

All items were rated (Likert scale 1 – 6), i.e. "None" (1), "Poor" (2), "Slightly Below Average" (3), "Slightly Above Average' (4), "Good" (5), and "Expert" (6).

A Harman's one-factor solution was computed which indicated that only 19.39% of ability is explained by an overall factor. This result indicated that the Ability subscale had a multifactor structure and that common method bias was not a serious threat to the findings regarding this subscale of the I-PIA-M. An EFA was subsequently computed to ascertain the factor structure of the Ability subscale.

Statistical data for the 46-item overall ability profile scale suggested good sampling adequacy, having reported a score of 0.94 in terms of the KMO measure of sampling adequacy (values between 0.8 and 1 indicated that the sampling was adequate). The Bartlett's test for sphericity significance was used to assess the suitability of the data for factor analysis. Since the significance $p = .000$, the data were deemed suitable for factor analysis.

Table 5.4 presents the results on the KMO measure of sampling adequacy and Bartlett's test of sphericity as follows:

Table 5.4

Results on the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, and Bartlett's Test of Sphericity: Abilities Subscale

Kaiser-Meyer-Olkin measure of sampling adequacy		.94
Bartlett's test of sphericity	Approx. chi-square	9353.48
	df	820
	Sig.	.00

Six factors with an eigenvalue greater than 1 are visible in Table 5.5. A rigorous cut-off of eigenvalues > 1.50 was applied and six factors were retained. Table 5.5 further shows that the multidimensionality of the I-PIA-M may be ascribed to the presence of a general factor.

Similar as under section 5.2.1. ,any given item was considered to belong to a particular factor if it had a factor loading of .50 or higher because the factors loading strongly onto an overall factor. Theoretical expectations and the contents of factors and items were considered when decisions either to include or omit items were not clear-cut. The EFA focused on discovering an underlying (simple) structure and not on determining it. The purpose of the EFA was seen as assisting to explore whether the original eight theoretically proposed factors could be reliably identified in order to conduct further statistical analyses. The EFA assisted in removing problematic items and identifying the factor on which the item had a better loading. As Table 5.5 shows, only six factors were retained following the EFA.

Table 5.5

Factor extraction using Principal Component Analysis (Abilities)

| Factor | Initial Eigenvalues | | | Rotation Method: Varimax |
	Total	Difference	Cumulative	Variance explained
1	19.39	15.35	0.47	17.23
2	4.04	1.51	0.57	3.09
3	2.53	0.89	0.63	3.00
4	1.64	0.16	0.67	2.66
5	1.48	0.35	0.71	2.21
6	1.13	0.29	0.74	2.01

Note: n = 100

The rotated factor pattern on the Ability subscale reflecting the unique variance each factor contributes to the variance of the observed variable is presented in Appendix D.

Table 5.6

Summary of Extracted Factors: Abilities

Factor	Label	Description	Number of items
1	Abstract reasoning and Verbal ability	Abstract reasoning implies the ability to use diagrams, symbols or shapes instead of words or numbers – it involves identifying the underlying logic and then determining the solution Verbal ability refers to the ability to evaluate the logic of various kinds of arguments.	24
2	Managing others	The ability to manage and encourage people, optimise their outputs and effectively manage relationships in order to achieve agreed goals.	5

3	Business acumen	The ability to understanding main business drivers in order to influence decision-making.	4
4	Resilience	The ability to maintain a positive outlook at work; works productively in a pressurised environment; keeps emotions under control during difficult situations.	4
5	Numerical ability	the ability to make correct decisions or inferences from numerical data. The tasks set and data presented are highly relevant to a range of careers.	3
6	Technical ability	Work undertaken by hand involving aesthetic, artistic, coordinated, dexterous, physical and sustained use of hands or fingers; craft and keyboard skills; correct use of tools and equipment. It includes the willingness to learn and develop opportunities in own discipline and area of expertise.	3
TOTAL			43

In summary, the EFA confirmed the multidimensionality of the I-PIA-M as proposed by the theoretical model relevant to the Ability subscale. The original Ability subscale of the I-PIA-M contained 43 items and eight factors. However, as shown in Table 5.6, only six factors were retained following the EFA. Consequently, no items were removed, leaving 41 items to be used in further statistical analysis, of which two items (items 2 and 35) formed part of more than one factor, namely, item 2 formed part of factors 2 and 6, whilst item 35 formed part of factors 3 and 5. The new six factors were re-labelled as shown in Table 5.6. These items will be considered towards the factor allocations in both instances respectively.

Overall, the I-PIA-M subscales comprised the following:

- *Career anchor preferences.* The eight original factor solution proposed by Schein (1990; 1996; 2006) was reduced to only six factors. Security/stability and technical/functional career anchors were removed because of the low internal consistency reliability coefficients.
- *Career interests.* Nine factors were retained (activity driven; people oriented; environment driven; business careers; customer support; financial/numerical; scientific orientation; administrative services; and information technology.
- *Ability.* Four factors were retained (verbal ability; numerical ability; abstract reasoning; and managing others). As shown in Table 5.7, the test for reliability for the business acumen dimension of the Abilities subscale achieved a low reliability coefficient (.50) and it was therefore not included in further statistical analyses.

5.3 STAGE 1: TESTING RELIABILITY AND CONSTRUCT VALIDITY OF THE I-PIA-M SUBSCALES

The next step was to test the internal consistency reliability and the construct validity of the three subscales of the I-PIA-M. The full data set was subjected to the testing of internal consistency reliability and construct validity (N = 270).

Table 5.7 summarises the Cronbach's alpha coefficients of the subdimensions of the three subscales of the I-PIA-M. For the purposes of this study, the acceptable reliability coefficient of >.70 will apply, consistent with previous research (Ghazali, 2016; Heale & Twycross, 2015). Overall, Table 5.9 shows acceptable internal consistency reliability coefficients (>.70) for the various subscale dimensions. Although the reliability coefficients for general management (.64) and lifestyle (.66) were below the threshold of > .70, they were acceptable for group-based research purposes. The security (.60) and technical/functional (.42) career anchor preferences were also removed because of low internal reliability coefficients. Although not feasible for more complex studies, an internal consistency reliability value of 0.65 to 0. 70 can be considered as acceptable in exploratory research (Žukauskas, Vveinhardt & Andriukaitienė, 2018). However, Churchill and Peter (1984) concluded that a reliability value of below .60 will be totally unacceptable. The business acumen dimension (.50) was therefore also not included in further statistical analyses.

Table 5.7

Internal Consistency Reliability: Subscales of the I-PIA-M

Subscale dimensions	Cronbach's alpha coefficient
Career Preferences	**.88**
General management	.64
Autonomy/independence	.70
Lifestyle	.66
Entrepreneurial creativity	.78
Service/dedication to a cause	.70
Pure challenge	.75
Security	.60
Technical/functional	.42
Career Interests	**.98**
Activity driven	.94
People oriented	.88
Environment driven	.80
Business careers	.94
Customer support	.93
Financial/numerical	.95
Scientific orientation	.96
Administrative services	.86
Information technology	.94
Ability	**.96**
Verbal ability	.95
Numerical ability	.79
Abstract reasoning	.82
Managing others	.88
Business acumen	.50

Note: N = 270

Table 5.8 summarises the overall composite reliability coefficients (a less biased measure than Cronbach's alpha coefficient) of the three subscales of the I-PIA-M, as well as the convergent and discriminant validity results.

Table 5.8

Composite Reliability, Convergent and Discriminant Validity of the I-PIA-M

Scale dimension	CR	AVE	MSV	ASV	Construct validity **CR > AVE** **AVE > .50**	Discriminant validity **MSV < AVE** **ASV < AVE**
Career anchor preferences	.82	.47	.15	.10	CR > AVE **AVE < .50** **(close to .50)**	MSV < AVE ASV < AVE
Career interests	.95	.67	.15	.09	CR > AVE **AVE > .50**	MSV < AVE ASV < AVE
Ability	.94	.81	.06	.04	CR > AVE **AVE > .50**	MSV < AVE ASV < AVE

Note: N = 270; CR: composite reliability; AVE: average variance extracted; MSV: maximum shared variance; ASV: average shared variance

Construct validity encompasses convergent and discriminant validity and represents an assessment of consistency (DeVellis, 2016). Convergent validity indicates that an assessment instrument actually measures what it purports to measure. Discriminant validity indicates the extent to which factors in a scale are uncorrelated, thus confirming that each factor is distinct (DeVellis, 2016). The overall assessment of convergent validity requires that CR > AVE and that AVE > .50. Discriminant validity is established when maximum shared variance (MSV) < AVE (average variance extracted) and average shared variance (ASV) < AVE (DeVellis, 2016). Table 5.8 shows that the three subscales comprising the I-PIA-M had adequate convergent and discriminant validity.

5.4 STAGE 1: TESTING THE CONSTRUCT VALIDITY OF THE I-PIA-M MEASUREMENT MODEL

The next step was to assess the overall construct validity of the measurement model of the I-PIA-M with PATH analysis using CFA. The full data set was subjected to the testing of construct validity (N = 270). The SAS Version 9.4 for Windows (SAS, Inc., 2013) with maximum likelihood estimation and a Levenberg-Marquardt (scaling update of More, 1978) optimisation technique were used in the data analyses. The general rule of thumb for a PATH analysis is that the maximum likelihood estimation (estimate) should range between > .30 (average convergence), > .50 (good convergence) and > .70 (excellent convergence) for an indication of goodness of fit (Tiernan & Kelly, 2014).

As shown in Table 5.9, three competing CFA models were computed:
- Model 1: All subdimensions of the three subscales loading onto an overall factor

- Model 2: The items of each subscale loading onto the respective subscale (i.e. career anchor preferences, career interests and abilities), and the three subscales loading onto an overall factor (multidimensional model)
- Model 3: The items of each subscale loading onto the respective subscale (i.e. career anchor preferences, career interests and abilities). The security subdimension of the career anchor preferences subdimension was omitted to optimise the multidimensional model fit.

Table 5.9

Model Fit Statistics: Testing the Measurement Model Validity of the I-PIA-M

CFA Model	Chi-square (*p*)	df	RMSEA	SRMR	CFI	NNI	AIC
1	4066.93***	169	.30	.29	.23	.14	4148.93
2	1652.56***	205	.17	.07	.71	.67	1748.56
3	294.54***	123	.08	.06	.97	.92	428.54

Note: N = 270; ***p < .0001

Table 5.9 shows that the model-fit indices for the CFA Model 1 (all subdimensions of the three subscales loading onto an overall factor) generally indicated poor fit. The chi-squared/*df* ratio = 24.06, which is unacceptably high, while the p = .0001. RMSEA and SRMS were higher than the threshold value of <.08, indicating poor fit. The CFI and NNI were also below the threshold value of > .90, representing poor fit.

The fit indices for CFA Model 2 (the items of each subscale loading onto the respective subscale [i.e. career anchor preferences, career interests and abilities], and the three subscales loading onto an overall factor), also indicated a poor fit with the data.

The fit indices for CFA Model 3 (the items of each subscale loading onto the respective subscale [i.e. career anchor preferences, career interests and abilities]) indicated a good fit with the data. The chi-square (294.54)/*df* (123) ratio = 2.40, which also meets the criterion for good fit. The RMSEA = .08 and the SRMR = .06 indicated good model fit. The CFI = .97 and NNI = .92 also indicated good fit. Lastly, the AIC = 428.54, which was significantly lower than the AIC for Models 1 and 2, thus indicating Model 3 as the best fit measurement model. The model fit indices also provided evidence of construct validity in the I-PIA-M measurement model.

The standardised PATH loadings were further investigated for convergent validity. Table 5.10 clearly indicates that the estimates for all the items loading on the factors indicated a convergence estimate of > .30 (average) to >.70 (excellent), which implies acceptable goodness of fit (convergent validity). The t-values are all indicating significant path loadings: > 2.56 ($p \leq .01$).

Table 5.10

Standardised PATH Loadings of the I-PIA-M Subscales (CFA Model 3)

Endogenous variable	Exogenous variable	Estimate	t
Career interests	Activity driven	.98	208.18
Career interests	People oriented	.72	23.31
Career interests	Environment driven	.77	31.76
Career interests	Business careers	.86	53.82
Career interests	Customer support	.74	24.87
Career interests	Financial/numerical	.84	43.10
Career interests	Scientific orientation	.83	43.99
Career interests	Administrative services	.75	27.55
Career interests	Information technology	.82	39.06
Ability	Verbal ability	.94	100.93
Ability	Numerical ability	.75	26.10
Ability	Abstract reasoning	.95	115.32
Ability	Managing others	.95	117.57
Career anchor preferences	General management	.90	8.41
Career anchor preferences	Autonomy/independence	.38	6.71
Career anchor preferences	Lifestyle	.34	5.98
Career anchor preferences	Entrepreneurial creativity	.74	9.56
Career anchor preferences	Service/dedication to a cause	.52	8.99
Career anchor preferences	Pure challenge	.97	13.66

Note: N = 270. t-values > 2.56 ($p \leq .01$). t-values >1.96 ($p \leq .05$)

Overall, the CFA results provided evidence of measurement model validity pertaining to the I-PIA-M. In conclusion, the results of Stage 1 of the statistical analysis provided evidence in support of research hypothesis H1:

H1: The elements of the theoretical framework for career anchor preferences, career interests and abilities can be operationalised into a valid and reliable I-PIA-M.

Sub-aim 1.1 was thus achieved:

To determine the psychometric properties (reliability and validity) of the integrated career anchor preferences, career interests and abilities (I-PIA-M) scale.

5.5 STAGE 2: DESCRIPTIVE STATISTICS AND BI-VARIATE CORRELATIONS

Stage 2 of testing research hypothesis H1 involved exploring the magnitude and direction of the correlations between the subscale variables of the I-PIA-M best fit model. This stage addressed the following research sub-aim:

Sub-aim 1.2: To ascertain the nature of the interrelationships between the subscale dimensions of the newly developed I-PIA-M.

5.5.1 Means and standard deviations

Table 5.11 presents the means and standard deviations for the three subscales. The table shows that for career anchor preferences, most scores represent dominant scores, except for general management ($M = 3.39$; $SD = 1.02$) and autonomy/independence ($M = 3.86$; $SD = 0.99$) which yielded mid-range scores for the sample. In terms of dominant career anchor preferences, scores vary between $M = 4.08$ and $M = 4.37$ for the sample. No mean scores below $M = 3.39$ were reported. The three highest career anchor preferences were lifestyle, service/dedication to a cause, and pure challenge.

Table 5.11

Means and Standard Deviations

Scale	Mean	Standard deviation
Career anchor preferences		
Lifestyle	4.37	0.95
Service/dedication to a cause	4.37	0.99
Pure challenge	4.25	0.98
Entrepreneurial creativity	4.08	1.18
General management	3.39	1.02
Autonomy/independence	3.86	0.99
Career interests		
People oriented	4.90	0.70
Business careers	4.01	0.87
Customer support	4.01	0.88
Environment driven	3.83	0.96

Activity driven	3.80	0.73
Financial numerical	3.47	1.02
Administrative services	3.32	1.03
Information technology	2.72	1.18
Scientific orientation	2.56	1.06
Abilities		
Managing others	4.39	0.97
Abstract reasoning	4.17	1.05
Verbal ability	4.11	1.38
Numerical ability	3.91	1.06

In terms of career interests, people oriented ($M = 4.90$; $SD = 0.70$), business careers ($M = 4.10$; $SD = 0.87$) and customer support ($M = 4.01$; $SD = 0.88$) achieved a high score range for the sample. The environment driven ($M = 3.83$; $SD = 0.96$), activity driven ($M = 3.80$; $SD = 0.73$), financial/numerical ($M = 3.47$; $SD = 1.02$) and administrative services ($M = 3.32$; $SD = 1.03$) yielded mind-range scores for the sample, while information technology ($M = 2.72$; $SD = 1.18$) and scientific orientation ($M = 2.56$; $SD = 1.06$) had the lowest mean scores.

Table 5.11 shows that most mean scores ranged between $M = 4.11$ and $M = 4.39$, representing dominant abilities scores, apart from numerical ability ($M = 3.91$; $SD = 1.06$) which yielded a midrange score for the sample. No mean scores below $M = 3.91$ were reported. The most dominant abilities were managing others, abstract reasoning and verbal ability.

5.5.2 Bi-variate correlations: Career Anchor Preferences and Career Interests

Table 5.12 reports the bi-variate correlations between the career anchor preferences and career interests subscales of the I-PIA-M.

Table 5.12 Shows that the correlations between the subscales were predominantly positive (with the exception of the negative correlations between lifestyle variable and scientific orientation [$r = -0.01$; $p = .01$] and lifestyle variable and information technology [$r = -0.02$; $p = .05$]). The correlations ranged between $r \geq 0.01$ and $r \leq 0.40$; $p \leq .05$, with small to moderate practical effect. The correlation range suggests that multicollinearity was not a threat to the findings.

Table 5.12

Bi-Variate correlations: Career Anchor Preferences and Career Interests

Variables	Activity driven	People oriented	Environment driven	Business careers	Customer support	Financial/ numerical	Scientific orientation	Administrati ve services	Information technology
General management	0.26***	0.31***	0.27***	0.24***	0.18*	0.26***	0.17*	0.19*	0.19*
Autonomy/independence	0.12*	0.07*	0.03*	0.11*	0.10*	0.06*	0.14*	0.01**	0.12*
Lifestyle	0.01**	0.08*	0.04*	0.04*	0.09*	0.06*	-0.01**	0.05*	-0.02*
Entrepreneurial creativity	0.34***	0.19*	0.28***	0.40***	0.33***	0.34***	0.32***	0.22***	0.30***
Service/dedication to a cause	0.26***	0.35***	0.17*	0.21***	0.34***	0.16*	0.17*	0.24***	0.18*
Pure challenge	0.37***	0.43***	0.37***	0.31***	0.33***	0.35***	0.24***	0.27***	0.27***

Note: N = 270. ***$p ≤$. 001; ** $p ≤ .01$; *$p ≤$ *0.05

5.5.3   Bi-variate correlations: Career Anchor Preferences and Ability

Table 5.13 reports the bi-variate correlations of the Career Anchor Preferences and Ability subscales of the I-PIA-M.

Table 5.13

Bi-Variate Correlations: Career Anchor Preferences and Ability

Variables	General management	Autonomy/ independence	Entrepreneurial creativity	Service/ dedication to a	Pure challenge	Lifestyle
Verbal ability	0.16*	0.10*	0.12*	0.05*	0.23***	0.05*
Numerical ability	0.24***	0.16*	0.20***	0.06*	0.28***	0.06*
Abstract reasoning	0.18*	0.17*	0.17*	0.05*	0.27***	0.07*
Managing others	0.22***	0.13*	0.16*	0.11*	0.29***	0.07*

Note: N = 270. ***$p ≤$. 001; ** $p ≤ .01$; *$p ≤$ *0.05

Table 5.13 Shows that the correlations between the subscales were predominantly positive. The correlations ranged between $r ≥ 0.05$ and $r ≤ 0.29$; $p ≤ .05$, with small practical effect. The correlation range suggests that multicollinearity was not a threat to the findings.

231

5.5.4 Bi-variate correlations: Career Interests and Ability

Table 5.14 reports the bi-variate correlations of the Career Interests and Ability subscales of the I-PIA-M.

Table 5.14

Bi-Variate Correlations: Career Interests and Ability

Variables	Verbal ability	Numerical ability	Abstract reasoning	Managing others
Activity driven	0.11*	0.18*	0.16*	0.13*
People oriented	0.05*	0.04*	0.12*	0.14*
Environment driven	0.14*	0.34***	0.20***	0.18*
Business careers	0.15*	0.23***	0.21***	0.19*
Customer support	0.09*	0.14*	0.16*	0.15*
Financial numerical	0.16*	0.35***	0.21***	0.19*
Scientific orientation	0.08*	0.17*	0.09*	0.04*
Administrative services	0.06*	0.07*	0.08*	0.09*
Information technology	0.06*	0.13*	0.06*	0.03*

Note: N = 270. ***$p \leq$. 001; ** $p \leq$ .01; *$p \leq$ *0.05

Table 5.14 shows that the correlations between the subscales were predominantly positive. The correlations ranged between $r \geq 0.03$ and $r \leq 0.35$; $p \leq .05$ (small to moderate practical effect). The correlation range suggests that multicollinearity was not a threat to the findings.

Overall, the correlation results provided additional evidence in support of research hypothesis H1:

H1: The elements of the theoretical framework for career anchor preferences, career interests and abilities can be operationalised into a valid and reliable I-PIA-M.

Sub-aim 1.2 was achieved:
To ascertain the nature of the interrelationships between the subscale dimensions of the I-PIA-M

5.6 BIOGRAPHICAL VARIABLES AS PREDICTORS OF CAREER ANCHOR PREFERENCES, CAREER INTERESTS AND ABILITIES

This section reports the results pertaining to research aim 2: to assess whether race, gender and age significantly and positively predict individuals' career anchor preferences, career interests and abilities.

Stepwise multiple regression analysis with backward elimination with SAS version 9.4 (SAS, Inc., 2013) was performed to test whether race, gender and age significantly predicted the career preferences, career interests and abilities of individuals. Table 5.15 summarises the significant results only. The results show that the biographical variables did not significantly predict Abilities ($F = 1.82$; $p = .14$) and that only race and gender contributed to explaining the variance in career interests and career anchor preferences.

Table 5.15

Significant Results of Stepwise Regression Analysis

Variable	Career Interests			Career Anchor Preferences		
	F	β	*p*	*F*	β	*p*
Race	23.38	-.48	<.0001	20.75	-.41	<.0001
Gender	12.19	-.36	.001	3.88	-.18	.05
Overall model						
Fp	20.06***			9.11***		
R²	.13			.09		

Note: N = 270. ***p = <.0001

Race contributed the most toward explaining the variance in career interests (β = -.48; p = <.0001) and career anchor preferences (β = -.41; p = <.0001), while gender also contributed significantly toward explaining career interests (β = -.36; p = <.001) and career preferences (β = -.18; p = .05). In terms of career interests, the overall model explained 13% ($R² = .13$; moderate practical effect; $F = 20.06$; p = <.0001) of the variance, while the overall model also explained 9% ($R² = .09$; moderate practical effect; F = 9.11; p = < .0001) of the variance in of career preferences.

The results provided partial supportive evidence for research hypothesis H2:

H2: Race, age and gender significantly predict individuals' career preferences, career interests and abilities.

Research aim 2 was achieved:
To assess whether race, age and gender significantly and positively predict individuals' career anchor preferences, career interests and abilities.

5.7 TESTS FOR SIGNIFICANT MEAN DIFFERENCES

This section reports on the results for testing research hypothesis H3: Individuals from various race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities. SAS version 9.4 (SAS, Inc., 2013) was utilised to conduct independent samples t-tests. Tables 5.16, 5.17 and 5.18 report the source of the significant differences observed from the t-tests.

Table 5.16

Source of Significant Mean Differences: Race

Factor	Socio-biographical subgroup	N	Mean	SD	Source of significant difference between means	Test statistic	p	Cohen's d
Career interests	Black	191	3.78	.80	Black – white	5.26	<.0001	0.75
	White	77	3.25	.60	Mean = .53 (SD = .75)			
Activity driven	Black	191	3.92	.77	Black – white	4.34	<.0001	0.63
	White	77	3.50	.54	Mean = .42 (SD = .71)			
People oriented	Black	191	5.00	0.70	Black – white	4.03	<.0001	0.55
	White	77	4.63	0.64	Mean = .37 (SD = .68)			
Environment driven	Black	191	4.00	0.94	Black – white	4.64	<.0001	0.63
	White	77	3.42	0.90	Mean = .58 (SD = .93)			

234

Business careers	Black	191	4.10	0.89	Black – white	2.87	0.0044	0.40
	White	77	3.77	0.77	Mean = .33 (SD = .86)			
Customer support	Black	191	4.15	0.92	Black – white	3.99	<.0001	0.56
	White	77	3.69	0.70	Mean = .46 (SD = .86)			
Financial/numerical	Black	191	3.64	1.02	Black – white	4.32	<.0001	0.59
	White	77	3.06	0.94	Mean = .58 (SD = 1.00)			
Scientific orientation	Black	191	2.73	1.06	Black – white	4.27	<.0001	0.59
	White	77	2.13	0.98	Mean = .60 (SD = 1.03)			
Administrative services	Black	191	3.50	1.05	Black – white	4.50	<.0001	0.64
	White	77	2.89	0.85	Mean = .61 (SD = 1.00)			
Information technology	Black	191	2.96	1.14	Black – white	5.49	<.0001	0.75
	White	77	2.13	1.08	Mean = .83 (SD = 1.12)			
Career Anchor Preferences	Black	190	4.17	0.67	Black – white	4.84	<.0001	0.65
	White	77	3.75	0.62	Mean = .43 (SD = .66)			
General management	Black	190	3.49	1.02	Black – white	2.77	0.0061	0.39
	White	77	3.11	0.95	Mean = .38 (SD = 1.00)			
Entrepreneurial creativity	Black	190	4.25	1.19	Black – white	3.90	0.0001	0.53
	White	77	3.65	1.06	Mean = .61 (SD = 1.15)			
Service/dedication to a cause	Black	190	4.55	0.91	Black – white	4.98	<.0001	0.66
	White	77	3.93	0.98	Mean = .63 (SD = .93)			
Pure challenge	Black	190	4.43	0.93	Black – white	5.02	<.0001	0.67
	White	77	3.79	0.98	Mean = .64 (SD = .94)			

Note: N = 270.

Table 5.17

Source of Significant Mean Differences: Gender

Factor	Socio-biographical subgroup	N	Mean	SD	Source of significant difference between means	Test Statistic	*p*	Cohen's d
Career interests	Male	72	3.94	0.87	Female – male	4.13	<.0001	0.54
	Female	198	3.51	0.72	Mean = 0.4323 (SD = 0.7602)			
Activity driven	Male	72	4.10	0.83	Female – male	4.26	<.0001	0.55
	Female	198	3.69	0.66	Mean = 0.4157 (SD = 0.7095)			
People oriented	Male	72	5.09	0.76	Female – male	2.79	0.0057	0.37
	Female	198	4.82	0.66	Mean = 0.2652 (SD = 0.6908)			
Environment driven	Male	72	4.11	1.01	Female – male	2.83	0.0050	4.45
	Female	198	0.93	0.07	Mean = 0.3698 (SD = 0.9488)			
Business careers	Male	72	4.26	1.03	Female – male	2.85	0.0048	0.37
	Female	198	3.92	0.79	Mean = 0.3358 (SD = 0.8574)			
Financial/numerical	Male	72	3.76	1.11	Female – male:	2.83	0.0050	0.38
	Female	198	3.37	0.98	Mean = 0.3944 (SD = 1.0131)			
Scientific orientation	Male	72	3.04	1.20	Female – male	4.69	<.0001	0.57
	Female	198	2.38	0.96	Mean = 0.6623 (SD = 1.0254)			
Administrative services	Male	72	3.60	1.08	Female – male	2.72	0.0070	0.37
	Female	198	3.22	0.99	Mean = 0.3809 (SD = 1.0181)			
Information technology	Male	72	3.30	1.27	Female – male	5.16	<.0001	0.68

	Female	198	2.50	1.07	Mean = 0.8011 (SD = 1.1291)			
	Female	198	4.06	1.38	Mean = 0.1633 (SD = 1.3869)			
Career Anchor Preferences	Male	72	4.22	0.68	Female – male	2.49	0.0133	0.34
	Female	198	3.99	0.67	Mean = 0.2322 (SD = 0.2322)			
General management	Male	72	3.67	1.08	Female – male	2.80	0.0055	0.38
	Female	198	3.28	0.97	Mean = 0.3875 (SD = 1.0015)			
Entrepreneurial creativity	Male	72	4.39	1.14	Female – male	2.56	0.0110	0.36
	Female	198	3.98	1.18	Mean = 0.4154 (SD = 1.1728)			
Pure challenge	Male	72	4.48	0.94	Female – male	2.36	0.0191	0.33
	Female	198	4.16	0.98	Mean = 0.3169 (SD = 0.9714)			

Note: N = 270.

Table 5.18

Source of Significant Mean Differences: Age

Factor	Socio-biographical subgroup	N	Mean	SD	Source of significant difference between means	Test Statistic	*p*	Cohen's d
Abstract reasoning	<= 40 years	230	4.11	1.04	<= 40 years – 40+ years	-2.29	0.0225	0.40
	40+ years	39	4.52	1.05	Mean = -0.41 (SD = 1.04)			
Autonomy/independence	<= 40 years	230	3.92	0.99	<= 40 years – 40+ years	2.33	0.0207	0.41
	40+ years	39	3.52	0.97	Mean = 0.40 (SD = 0.99)			

Note: N = 270.

237

5.7.1 Career interests

<u>Race</u>

Table 5.16 shows that black and white participants differed significantly on the career interests, with black participants scoring significantly higher than their white counterparts on the following variables:

- activity driven (*M* black = 3.92; *M* white = 3.50; moderate practical effect of *Cohen d* = 0.63), people oriented (*M* black = 5.00; *M* white = 4.63; moderate practical effect of *Cohen d* = 0.55), environment driven (*M* black = 4.00; *M* white = 3.42; moderate practical effect of *Cohen d* = 0.63), business careers (*M* black = 4.10; *M* white = 3.77; slightly moderate practical effect of *Cohen d* = 0.40),
- customer support (*M* black = 4.15; *M* white = 3.69; moderate practical effect of *Cohen d* = 0.56), financial/numerical (*M* black = 3.64; *M* white = 3.06; moderate practical effect of *Cohen d* = 0.59), scientific orientation (*M* black = 2.73; *M* white = 2.13; moderate practical effect of *Cohen d* = 0.59), administrative services (*M* black = 3.50; *M* white = 2.89; moderate practical effect of *Cohen d* = 0.64), and
- information technology (*M* black = 2.96; *M* white = 2.13; moderate practical effect of *Cohen d* = 0.75):
- overall career interests (black mean = 3.78 vs white mean = 3.25; *p* = <.0001; moderate practical effect of *Cohen d* = 0.75).

<u>Gender</u>

Table 5.17 shows that male and female participants differed significantly on all the career interests, with male participants scoring significantly higher than their female counterparts on the following variables:

- activity driven (*M* male = 4.10; *M* female = 3.69; moderate practical effect of *Cohen d* = 0.55), people oriented (*M male = 5.09; M female = 4.82*; low-moderate practical effect of *Cohen d* = 0.37),
- environment driven (*M male = 4.11; M female = 0.93*; extremely high practical effect of *Cohen d* = 4.45),
- business careers (*M male = 4.26; M female = 3.92*; low-moderate practical effect of *Cohen d* = 0.37),
- customer support (*M male = 4.21; M female = 3.95*; small practical effect of *Cohen d* = 0.28), financial/numerical (*M male = 3.76; M female = 3.37*; low-moderate practical effect of *Cohen d* = 0.38),

- scientific orientation (*M male = 3.04; M female = 2.38*; moderate practical effect of *Cohen d =* 0.57),
- administrative services (*M male = 3.60; M female = 3.22*; low-moderate practical effect of *Cohen d =* 0.37),
- information technology (*M male = 3.30; M female = 2.50*; moderate practical effect of *Cohen d =* 0.68);
- overall career interests (M male = 3.94; M female = 3.51; *p =* <.0001; moderate practical effect of *Cohen d =* 0.54).

<u>Age</u>

Table 5.18 shows that participants from the ≤ 40 years and 40+ years age groups did not differ significantly on any of the career interests. The age category was split into ≤ 40 years and 40+ years age groups due to the representation of age groups and for parsimony reasons.

5.7.2 Abilities

<u>Race</u>

Table 5.16 shows that Black and White participants did not differ significantly on any of the abilities.

<u>Gender</u>

Table 5.17 shows that male and female participants did not differ significantly on any of the abilities.

<u>Age</u>

Table 5.18 shows that participants from the ≤ 40 years and 40+ years age groups differed slightly on abstract reasoning, with participants from the 40+ years scoring significantly higher than the ≤ 40 years age group (*M 40+ years = 4.52; M ≤ 40 years = 4.11; small practical effect of Cohen d = 0.40.*

5.7.3 Career anchor preferences

<u>Race</u>

Table 5.16 shows that black and white participants differed significantly on some of the career anchor preferences, with black participants scoring significantly higher than their white counterparts on the following career preferences:

- general management (*M* black = 3.49; *M* white = 3.11; slightly moderate practical effect of *Cohen d* = 0.39),
- entrepreneurial creativity (M black = 4.25; M white = 3.65; moderate practical effect of Cohen d = 0.53),
- service/dedication to a cause (M black = 4.55; M white = 3.93; moderate practical effect of Cohen d = 0.66), and
- pure challenge (M black = 4.43; M white = 3.79; moderate practical effect of Cohen d = 0.67)

Gender

Table 5.17 shows that male and female participants differed significantly on some of the career anchor preferences, with male participants scoring significantly higher than their female counterparts on the following career preferences:

- general management (*M* male = 3.67; *M* female = 3.28; slightly moderate practical effect of *Cohen d* = 0.38),
- entrepreneurial creativity (*M* male = 4.39; *M* female = 3.98; slightly moderate effect of *Cohen d* = 0.36),
- service/dedication to a cause (*M* male = 4.47; *M* female = 4.32; small practical effect of *Cohen d* = 0.16), and
- pure challenge (*M* male = 4.48; *M* female = 4.16; slightly moderate practical effect of *Cohen d* = 0.33).

Age

Table 5.18 shows that participants from the ≤ 40 years and 40+ years age groups differed slightly on the autonomy/independence career anchor preference, with participants from the 40+ group scoring slightly lower than the ≤ 40 year age group (*M 40+ years = 3.52; M ≤ 40 years = 3.92;* slightly moderate practical effect of *Cohen d* = 0.41).

The results provided supportive evidence for research hypothesis H3:

H3: Individuals from various race and gender groups differ significantly regarding their career interests, but not significantly regarding the abilities, and differ significantly on some of the career anchor preferences. Individuals from various age groups do not differ significantly on any of the career interests measured, differ slightly on one of the abilities, and significantly on one of the career anchor preferences.

Accordingly, research aim 3 was achieved:

To explore whether individuals from various race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities

5.8 CHAPTER SUMMARY

This chapter reported on the quantitative research in relation to the methodology criteria defined in Chapter 4.

Research aim 1 was to empirically operationalise the constructs of career anchor preferences career interests and abilities into an integrated empirical measurement scale to guide individual–organisational career path congruence in the South African organisational context. EFA and CFA were applied to determine the psychometric properties (reliability and validity) of the integrated career anchor preferences, career interests and abilities congruence scale of the newly developed I-PIA-M, and to report on the nature of the interrelationships between the I-PIA-M subscale dimensions.

The EFA confirmed the multidimensionality of the I-PIA-M, as proposed by the theoretical model relevant to the career anchor preferences, career interests and abilities subscales, thus concurring with the theoretical notions related to the contemporary multidirectional nature of careers as discussed in Chapter 2. In terms of the reliability and construct validity of the I-PIA-M subscales, the CFA results overall provided evidence of the measurement model validity of the I-PIA-M, thereby confirming that the multidimensional elements of the theoretical framework for career anchor preferences, career interests and abilities can be operationalised into a valid and reliable I-PIA-M and, in turn, confirming the reliability and validity of the results obtained through the I-PIA-M. The original Career Interests Subscale of the I-PIA-M contained 125 items, of which 29 were removed, leaving 96 items against nine factors (relabelled as shown in Table 5.3). In terms of the Abilities subscale as shown in Table 5.6, 41 items were retained on four factors *re-labelled as shown in table 5.6.

To ascertain the nature of the interrelationships between the subscale dimensions of the newly developed I-PIA-M, the means and standard deviations for the three subscales were calculated and reported that for career anchor preferences, career interests and abilities dominant, moderate and lowest means scores were identified. Bi-variate correlations confirmed logical patterns between the various subscales to inform meaningful career choice decision-making.

Results on the biographical variables (race; gender; age) as predictors of career anchor preferences, career interests and abilities (research aim 2) showed that race and gender

significantly and positively predicted individuals' career interests but did not significantly predict the abilities.

Age, in the context of this study did not predict career interests significantly, and significantly predicted one of the abilities. All three biographical variables (race; gender; age) predicted some of the career interests, abilities and career anchor preferences.

Stepwise multiple regression analysis with backward elimination with SAS version 9.4 (SAS, Inc., 2013) was performed to test whether race, gender and age significantly predicted the career preferences, career interests and abilities of individuals. Race and gender contributed the most toward explaining the variance in career anchor preferences and career interests, with age reporting a slight effect. In terms of the ability subscale, race contributed the most toward explaining the variance with gender and age contributing to a lesser degree.

Test for mean differences confirmed research aim 3, confirming that race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities.

The next chapter (Chapter 6: Research results: qualitative study) will describe and explain the qualitative research results of the empirical study.

CHAPTER 6

RESEARCH RESULTS: QUALITATIVE STUDY

The current research followed a mixed-method approach to achieving the aims of the research. Chapter 5 reported on the quantitative research results which involved testing the reliability and validity of the integrated career anchor preferences, career interests and abilities scale (I-PIA-M). The results reported in Chapter 5 provided evidence of the reliability and validity of the I-PIA-M and, hence, the researcher could with confidence apply the I-PIA-M in practice to explore the measure's usefulness in guiding individual–organisational career path congruence in the South African organisational context. This chapter reports on the results of the qualitative part of the study which applied the I-PIA-M to a sample of participants in the career counselling context.

6.1 RESULTS OF THE QUALITATIVE STUDY

The qualitative study related to research aim 4: to apply the empirically validated integrated career anchor preferences, career interests and abilities scale (I-PIA-M) in practice to assess individual–organisational career path congruence. It is important to note that the Career Orientations Inventory (COI) (Schein, 1990; 2006) was used to measure the participants' career anchor preferences, while the career interests and abilities subscales of the I-PIA-M were used to measure the participants' career interests and abilities. As part of the qualitative research design, the career construction interview (Savickas, 2005) was also used as a diagnostic tool to explore the participants' core career-life themes.

As described in Chapter 4 (Research method), a total of five (n = 5) participants were included in the qualitative study. As stated under chapter 4, purposive or deliberate sampling was used to recruit the participants for the qualitative study with the aim to obtain a wealth of information. These participants were asked to complete the I-PIA-M (career interests and abilities subscales), the COI (Schein, 2006), and the career construction interview questionnaire (Savickas, 2005). As discussed under section 5.4, the items of each subscale of the I-PIA-M was loaded onto the respective subscale (i.e. career anchor preferences, career interests and abilities). Participants in the qualitative study completed the I-PIA-M and results were interpreted against the subscales and post EFA factors of the quantitative study for the purposes of drawing conclusions.

The following propositions were made for the qualitative study:

- Individuals attach various meanings to their perceptions of their career interests which manifest as core life themes influencing person–organisational career path congruence.
- Individuals attach various meanings to their perceptions of their abilities which manifest as core life themes influencing person–organisational career path congruence.
- Individuals attach various meanings to their perceptions of their career anchor preferences which manifest as core life themes influencing person–organisational career path congruence.
- Individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences (as measured by the I-PIA-M) which manifest as core life themes influencing person–organisational career path congruence.
- Individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences (as measured by the I-PIA-M), and the career-life themes elicited from the career construction interview, which manifest as core life themes influencing person–organisational career path congruence.

Figure 6.1 illustrates an example of expected congruence between the I-PIA-M subscales (career anchor preferences, career interests and abilities) and the career construction interview. Person-career path congruence will be determined by the profile of the participants on the I-PIA-M, verified and enriched by prominent themes identified through the CCI to propose suggested career path alternatives (the latter based on theoretical and published job/work related sources discussed under chapter 3),
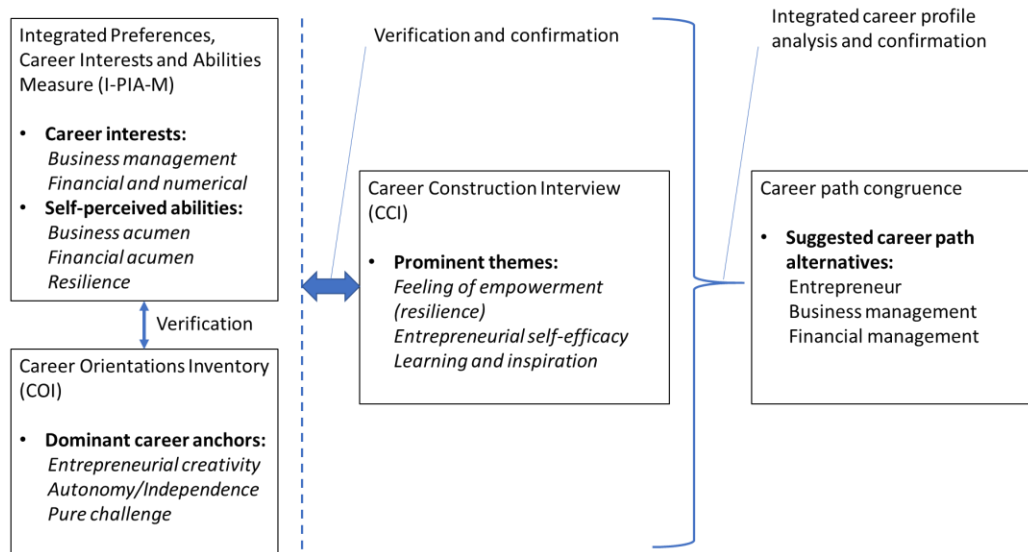
Figure 6.1 Example: Expected congruence between the I-PIA-M subscales (career anchor preferences, career interests and abilities) and the career construction interview

6.1.1 Results on the I-PIA-M: career interests

The participants' (N = 5) results on the I-PIA-M in terms of their self-perceived career interests are presented in Table 6.1 below.

All items were rated by means of a Likert-type scale with six options, namely "Strongly Dislike (1)", "Dislike (2)", "Slightly Dislike (3)", "Slightly like (4)', "Like (5)", and "Strongly Like (6)".

Table 6.1

Results on the Revised I-PIA-M (Career Interests Profile)

Respondent	Information Technology and Scientific orientation	Financial/ numerical	Business careers	People oriented	Administrative services	Customer support	Environment driven	Activity driven	Environment driven: Legal
A	3.11	5.8	3.61	5.5	2.82	5	6	5	5
B	2.58	2.5	2.94	5.4	1.64	5.2	6	6	3
C	2.84	3.5	3.83	5.7	1.91	4	5.2	4.3	4.7
D	1.37	3.5	2	4.7	2.64	3.8	4.2	3	5
E	1.42	1.1	2.22	2.9	1.36	2.6	2.7	2.3	2.7

With regard to interpreting the participants' profiles, Table 6.2 presents the definitions of the factors.

Table 6.2

Factor Definitions (Career Interests Profile)

Factor	Label	Description
1 and 2	Information Technology and Scientific orientation	The focus is on practising skilled trades, applied sciences and modern technologies.
3	Financial/ numerical	The focus is on planning, organising, directing and controlling financial activities, involving understanding and extracting appropriate meaning from numerical information.
4	Business careers	The focus is on advertising, marketing and the sale of goods and/or services to customers.
5	People oriented	The focus is on careers involving planning, organising, directing and evaluating business functions essential to efficient and productive business operations.

6	Administrative services	The focus is on supporting business operations by delivering routine, complex and specialised administrative duties in accordance with predefined processes and procedures.
7	Customer support	The focus is on assisting and guiding organisations in developing, starting and growing the business. It involves clarifying business goals and objectives and assisting in developing the skills and ways to acquire the resources needed to operate a successful enterprise.
8	Activity driven	The occupational trainer is a qualified technical or occupational expert who is equipped with the ability to deliver training in their specific field of expertise.
9	Environment driven (legal)	Legal professionals study, develop and apply law. In a corporate context, the focus of the legal professional is on determining and ensuring that all business practices, policies and procedures meet regulatory requirements, and to advise the business on how to protect its legal interests.

Respondent A reported a moderate score on information technology and scientific orientation (3.11) and a slightly low score on administrative services (2.82). High scores were reported on environment driven (6), financial/ numerical (5.8), people oriented (5.5), customer support (5), activity driven (5) and environment driven (legal) (5). The themes for which the highest scores were reported relate to the environment driven, financial and numerical, and people oriented career interests.

Respondent B reported moderate scores on environment driven (legal) (3), business careers (2.94), information technology and scientific orientation (2.58), and financial/ numerical (2.5), and a low score on administrative services (1.64). High scores were reported on environment driven (6), activity driven (6), people oriented (5.4), and customer support (5.2). The themes for which the highest scores were reported relate to the environment driven, people oriented, activity driven and customer support career interests.

Respondent C reported moderate scores on environment driven (legal) (4.7), activity driven (4.3), customer support (4), business careers (3.83), financial/ numerical (3.5), and a somewhat lower score on information technology and scientific orientation (2.84) and a low score on administrative services (1.91). High scores were reported on people oriented (5.7) and environment driven (5.2).

The themes for which the highest scores were reported relate to the people oriented, environment driven, and environment driven (legal) career interests.

Respondent D reported moderate scores for people oriented (4.7), environment driven (4.2), customer support (3.8), financial/ numerical (3.5), activity driven (3), and low scores for administrative services (2.64) and business careers (2), and information technology and scientific orientation (1.37). A high score was reported for environment driven (legal) (5). The themes for which the highest scores were reported relate to the environment driven (legal), people oriented, and environment driven career interests.

Respondent E reported a moderate score on people oriented (2.9), and somewhat lower scores on environment driven (2.7), environment driven (legal) (2.7), customer support (2.6), and low scores on activity driven (2.3), business careers (2.22), information technology and scientific orientation (1.42), administrative services (1.36), and financial/ numerical (1.1). Accordingly, no high scores were reported. The theme for which the highest scores were reported relate to the people oriented, environment driven, environment driven (legal), and customer support career interests.

6.1.2   Results on the I-PIA-M: abilities

The results of the participants on the I-PIA-M in terms of self-perceived abilities are presented in Table 6.3 below. As stated in chapter 5, the business acumen dimension achieved a low reliability coefficient (.50) and were therefore not included in the qualitative statistical analysis.

All items were rated (Likert-type scale 1 – 6), i.e. "None" (1), "Poor" (2), "Slightly Below Average" (3), "Slightly Above Average' (4), "Good" (5), and "Expert" (6).

Table 6.3

Results on the Revised I-PIA-M (Abilities Profile)

Respondent	Abstract reasoning and verbal ability	Managing others	Numerical ability
A	5.4	6	4.7
B	5.5	6	4
C	4.5	6	3.3
D	5.4	6	3.3
E	4.5	5	2

With regard to interpreting participants' profiles, Table 6.4 represents the definitions of the factors.

Table 6.4

Factor definitions (Abilities Profile)

Factor	Label	Description
1 and 2	Abstract reasoning and verbal ability	Ability to analyse, structure and articulate information through the application of effective problem solving and judgement capability.
3	Managing others	Coaches, mentors and motivates others to meet the organisation's vision, commitments and goals.
4	Numerical ability	Maintains and applies a broad understanding of financial principles to ensure decisions are fiscally sound and responsible.

Respondent A reported high self-perceived abilities scores on managing others (6), abstract reasoning and verbal ability (5.4), while a moderate score was reported on numerical ability (4.7). The themes for which the highest scores were reported relate to managing others, abstract reasoning and verbal ability.

Respondent B reported high self-perceived abilities scores on managing others (6), abstract reasoning and verbal ability (5.5), while a moderate score was reported for numerical ability (4). The themes for which the highest scores were reported relate to managing others, abstract reasoning and verbal ability.

Respondent C reported high self-perceived abilities scores on managing others (6), while moderate scores were reported on abstract reasoning and verbal ability (4.5) and slightly lower scores on and numerical ability (3.3). The themes for which the highest scores were reported relate to managing others, abstract reasoning and verbal ability.

Respondent D reported high self-perceived abilities scores on managing others (6), abstract reasoning and verbal ability (5.4), reporting slightly lower score on numerical ability (3.3). The themes for which the highest scores were reported relate to managing others, abstract reasoning and verbal ability.

Respondent E reported high self-perceived abilities scores on managing others (5), while a moderate score was reported on abstract reasoning and verbal ability (4.5), and a low score for numerical ability (2). The themes for which the highest scores were reported relate to managing others, abstract reasoning and verbal ability.

6.1.3   Results on the Career Orientations Inventory: career anchor preferences

The results of the participants on their career anchor preferences, as measured by the COI scale, are presented in Table 6.5 below.

All items were rated by means of a Likert-type scale with four options: "Never true for me (1)", "Occasionally true for me (2;3)", "Often true for me (4;5)", and "Always true for me (6)".

Table 6.5

Results on Career Anchor Preferences Profile

Respondent	General Managerial (GM)	Autonomy/ Independence (AU)	Entrepreneurial Creativity (EC)	Service/ Dedication to a Cause (SV)	Pure Challenge (CH)	Lifestyle (LS)
A	2,2	4,8	4,2	2,8	5,4	4,2
B	4,4	5,4	4,2	4	4,4	4
C	2,6	2,4	3	4,4	2,4	2
D	4	4,2	3,8	3,4	5	4,4
E	1.8	4	3.4	4	5.8	4.6

With regard to interpreting participants' profiles, Table 6.6 presents the definitions of the factors.

Table 6.6

Factor definitions (Career Anchor Preferences Profile)

Factor	Label	Description
1	General management (GM)	Primarily excited by the opportunity to analyse and solve problems under conditions of incomplete information and uncertainty; likes harnessing people together to achieve common goals; stimulated (rather than exhausted) by crisis situations.
2	Autonomy/ Independence (AU)	Primarily motivated to seek work situations which are maximally free of organisational constraints; wants to set own schedule and own pace of work; is willing to trade off opportunities for promotion to have more freedom.
3	Entrepreneurial Creativity (EC)	Primarily motivated by the need to build or create something that is entirely their own project; easily bored and likes to move from project to project; more interested in initiating new enterprises than in managing established ones.

4	Service/ Dedication to a Cause (SV)	Primarily motivated to improve the world in some fashion; wants to align work activities with personal values about helping society; more concerned with finding jobs which match their values rather than their skills.
5	Pure Challenge (CH)	Primarily motivated to overcome major obstacles, solve almost unsolvable problems, or win out over extremely tough opponents; define their careers in terms of daily combat or competition in which winning is everything; very single-minded and intolerant of those without comparable aspirations.
6	Lifestyle (LS)	Primarily motivated to balance career with lifestyle; highly concerned with such issues as paternity/maternity leaves, day-care options, etc.; looks for organisations that have strong pro-family values and programmes.

According to Schreuder and Coetzee (2016) and Bezuidenhout et al. (2013), a single, dominant career anchor emerges that stabilises, guides and constrains an individual's career path. However, research provides evidence of the existence of a multiple career anchor profile comprising primary, secondary and even tertiary career anchor preferences.

Respondent A reported high self-perceived career preference scores on pure challenge (5.4) and autonomy/independence (4.8), while a moderate score was reported on entrepreneurial creativity (4.2) and lifestyle (4.2) and low scores were reported on service/dedication to a cause (2.8) and general management (2.2). Based on these results, pure challenge represents the respondent's primary anchor, with autonomy/independence as the secondary anchor, and entrepreneurial creativity and lifestyle as tertiary anchors.

Respondent B reported high self-perceived career preference scores on autonomy/independence (5.4), while moderate scores were reported on general management (4.4), pure challenge (4.4), entrepreneurial creativity (4.2), service/dedication to a cause (4), and lifestyle (4). Based on these results, autonomy/independence represents the respondent's primary anchor, with general management and pure challenge representing secondary anchors and entrepreneurial creativity the tertiary anchor.

Respondent C reported moderate self-perceived career preference scores on service/dedication to cause (4.4) and entrepreneurial creativity (3), while low scores were reported on general

management (2.6), autonomy/independence (2.4), pure challenge (2.4), and lifestyle (2). Based on these results, service/dedication to a cause represents the respondent's primary anchor, with entrepreneurial creativity as the secondary anchor, and general management as tertiary anchor.

Respondent D reported a high self-perceived career preference scores on pure challenge (5), with moderate scores reported on lifestyle (4.4), autonomy/independence (4.2), general management (4), entrepreneurial creativity (3.8), and service/dedication to a cause (3.4). Based on these results, pure challenge represents the respondent's primary anchor, with lifestyle the secondary anchor, and autonomy/independence representing the tertiary anchor.

Respondent E reported high self-perceived career preference scores on pure challenge (5.8) and lifestyle (4.6), moderate scores were reported on autonomy/independence (4), service/dedication to a cause (4), and entrepreneurial creativity (3.4) and a low score was reported on general management (1.8). Based on these results, pure challenge represents the respondent's primary anchor, with lifestyle the secondary anchor. Autonomy/independence and service/dedication to a cause represent the respondent's tertiary anchors.

6.1.4 Results of the career construction interview

The participants' results in the career construction interview in terms of career-life themes are presented in Table 6.7 below.

Table 6.7

Results on the Career Construction Interview (Career-Life Themes)

Respondent	Career-life themes identified during the career construction interview
A	Role model: a former Miss South Africa who became a public speaker and devoted time to making the world a better place. Motto: 'not a bad life, just a bad day'. <u>Themes identified</u>: Ethics, career independency, driven, outspoken, straightforward, success orientation, positive energy, people oriented (empathy), diplomatic, shy and reserved, advice and counselling, enjoy business economics, accounting, credit control, teaching, educator, considered clinical psychology, advisory services.
B	No role models: achieve all by myself; enjoy development opportunities. Motto: 'I am knowledgeable'. <u>Themes identified</u>: Taking long to make decisions, enjoy corporate services, legal management, HR facilitation, enjoy reading about products, facts, legal matters, process design, investigative, believe in the power of now.

	Wanted to study psychology, could not for financial reasons changed to public sector management. If people interfere will take a stand and must be left alone. Enjoys subjects such as business economics and typing, no interests in languages and biology.
C	Role model: a nursing manager who displays good people interaction, energy, and places high value on ethics. Motto: 'once made decision universe make it happen'. <u>Themes identified</u>: Enjoys reading about global programmes e.g. UN development programme to better society, empathy, sometimes rubbing people up wrong way, humble. Enjoys gardening, sketching, reading autobiographies, eradicating poverty, project management, open and honest, enjoyed maths, science, poetry, no interest in history, enjoys facts, reality shows, gardening, cooking (enjoys aromas) and wine farming (interest in the botany side of it). Wanted to become an engineer.
D	Role model is a journalist who became a successful business woman and appears on television on business-related matters. Motto in life: 'One can achieve one's dream if remained focused'. <u>Themes identified</u>: Important how people from nothing create a meaningful career. Enjoys reading about political leaders (biographies) on challenges they had to overcome to reach their success. Enjoys intellectual conversation, very interested in legal and reality material, doing puzzles. Wanted to study medicine but due to financial constraints could not proceed. Time with family important. At school enjoyed mathematics, physical science. Enjoyed the human physiology part of Biology. Good at working with numerical figures, however, did not enjoy accounting as part of studies. Enjoys problem solving in general.
E	Role model is difficult to define as worked with various making an impact on life, however. Impression made related to creativity, spontaneous, no self-doubt, confident, and thinking long term. Motto in life: 'Do not lower own goals – adjust abilities to meet goals.' <u>Themes identified</u>: Building character as time goes along. Enjoys reading about political leaders (biographies) on challenges they had to overcome to reach their success. Enjoys activities challenging thinking capacity, involving some degree of adventure and uncertainty. Enjoys reading fiction such as Harry Potter, not particularly interested in biographies. Enjoys mathematics, life sciences and physics. Later years studied business management and marketing and found enjoys working with numbers, marketing and communications. Originally wanted to study towards a career in life sciences but due to financial constraints could not proceed at that point in time. Time with family important. At school enjoyed mathematics, physical science. Enjoys problem solving in general, especially scientific problem solving.

In the context of career construction theory (Savickas, 2005, 2013), an individual's life themes are identified through a career construction interview, in which the reason why people move in a particular career direction is explored; this represents the personal meaning attached to career life stories. Life themes explain an individual's life structure, vocational personality style, and career adaptability strategies (Savickas, 1990, 2013). Career construction theory (Savickas, 1990) incorporates and builds respective traditions of person–environment (P-E) fit emphasising traits, lifespan development emphasising developmental tasks, and narrative emphasising life themes to comprehend career as a story (Hartung & Vess, 2016). In career counselling, a narrative approach involves building a narrative identity (Vilhjálmsdóttir & Tulinius, 2016) where

"stories serve as the construction tools for building narrative identity and highlighting career themes in complex social interactions" (Savickas, 2011, p. 38).

According to Hartung and Vess (2016), the second question on the career construction interview is "Who did you admire when you were growing up? Tell me about her or him." The individuals are asked to describe three role models in terms of whom they describe who are and who they wish to become, as well as their central life goal, and solutions explored by participants to their main life problem (Hartung & Vess, 2016). The fifth question asks: "Tell me your favourite saying or motto". The response to give gives an indication of the inner wisdom and guidance the individual has for dealing with life's problems (Hartung & Vess, 2016).

Respondent A reported the following most prominent themes during the career construction interview: career independency; drive and energy; people oriented (empathy); business minded; and financial acumen. The themes represent congruence in terms of the respondent's most prominent career interests (environment driven; financial/ numerical; people oriented) and self-perceived abilities (managing others; abstract reasoning and verbal ability). The respondent's career anchor preferences profile indicates pure challenge, autonomy/independence, entrepreneurial creativity, and lifestyle as the most dominant career anchor preferences.

Respondent B reported the following most prominent themes during the career construction interview: analysis and investigative; people oriented; knowledge oriented; business economics; and process design. The themes represent congruence in terms of the respondent's most prominent career interests (environment driven; activity driven; people oriented; customer support) and self-perceived abilities (managing others; abstract reasoning and verbal ability). The respondent's career anchor preferences profile indicates autonomy/independence, general management, pure challenge and entrepreneurial creativity as the most dominant career anchor preferences.

Respondent C reported the following most prominent themes during the career construction interview: empathy; societal orientation (to better society as a whole); mathematical and scientific orientation; and creativity. These themes represent congruence in terms of the respondent's most prominent career interests [people oriented; environment driven (legal)] and self-perceived abilities (managing others; abstract reasoning and verbal ability). The respondent's career anchor preferences profile indicates service/dedication to a cause; and entrepreneurial creativity and general management as the most dominant career anchor preferences.

Respondent D reported the following most prominent themes during the career construction interview: achievement oriented; enjoys intellectual challenges; marketing activities and working with numbers. The themes represent congruence in terms of the respondent's most prominent career interests (environment driven (legal); people oriented) and self-perceived abilities (managing others; abstract reasoning and verbal ability). The respondent's career anchor preferences profile indicates pure challenge, lifestyle and autonomy/independence as the most dominant career anchor preferences.

Respondent E reported the following most prominent themes during the career construction interview enjoys challenges, applying cognitive capability, problem solving and enjoys mathematics, life sciences and physics. The themes represent congruence in terms of the respondent's most prominent career interests (people oriented; environment driven (legal); customer support) and self-perceived abilities (managing others; abstract reasoning and verbal ability). The respondent's career anchor preferences profile indicates pure challenge, lifestyle, autonomy/independence and service/dedication to a cause as the most dominant career anchor preferences.

6.1.5 Integration and evaluation

The participants' results on the I-PIA-M and the career construction interview in terms of career-life themes are presented in Table 6.8 below.

Table 6.8

Summary of Integrated Results: Career Interests, Abilities, Career Anchor Preferences and Career-Life Themes

Respondent	I-PIA-M (career interest profile) *Highest three scores considered measured on a 6-point scale*	I-PIA-M (abilities profile) *All scores considered measured on a 6-point scale*	I-PIA-M (career anchor preferences profile) *Highest three scores considered*	Career construction interview (career-life themes) *Most prominent themes considered*	Current organisational career path	Desired organisational career path
A	Environment driven (6) Financial/ numerical (5.8) People oriented (5.5)	Managing others (6) Abstract reasoning and verbal ability (5.4)	CH (5.4) AU (4.8) EC (4.2)/LS (4.2)	Career independency Drive and energy People oriented (empathy) Business minded Financial acumen	Personal assistant to the Executive	Human resources Financial services
B	Environment driven (6)/ Activity driven (6) People oriented (5.4) Customer support (5.2)	Managing others (6) Abstract reasoning and verbal ability (5.5)	AU (5.4) GM (4.4)/ CH (4.4)	Analysis and investigative People oriented Knowledge oriented Business economics Process design	Human resource consulting	Human resource consulting Specialist career path
C	People oriented (5.7) Environment driven (5.2)	Managing others (6) Abstract reasoning and verbal ability (4.5)	SV (4.4) EC (3) GM (2.6)	Empathy Societal orientation (to better society as a whole) Mathematical and scientific orientation Creativity	Nursing (Registered nurse)	Nursing manager/matron Horticulturist
D	Environment driven (5) People oriented (4.7)	Managing others (6) Abstract reasoning and verbal ability (5.4)	CH (5) LS (4.4) AU (4,2)	Achievement oriented Enjoys intellectual challenges Marketing activities and working with numbers	Personal assistant to the Executive	Legal profession General business management
E	People oriented (2.9) Environment driven (2.7) Customer support (2.6)	Managing others (5) Abstract reasoning and verbal ability (4.5)	CH (5.8) LS (4.6) AU (4) /SV (4)	Enjoys challenges Applying cognitive capability Problem solving Enjoys mathematics, life sciences and physics	Human resource consulting	Human resources Nursing/Medical Sciences Specialist career path

Note: In terms of the COI, the abbreviations are explained in Table 6.9.

Table 6.9

Definitions of the Career Orientations Inventory

Abbreviation	Label	Description
GM	General management	Primarily excited by the opportunity to analyse and solve problems under conditions of incomplete information and uncertainty; likes harnessing people together to achieve common goals; stimulated (rather than exhausted) by crisis situations.
AU	Autonomy/independence	Primarily motivated to seek work situations which are maximally free of organisational constraints; wants to set own schedule and own pace of work; is willing to trade off opportunities for promotion to have more freedom.
EC	Entrepreneurial creativity	Primarily motivated by the need to build or create something that is entirely their own project; easily bored and likes to move from project to project; more interested in initiating new enterprises than in managing established ones.
SV	Service/dedication to a cause	Primarily motivated to improve the world in some fashion; wants to align work activities with personal values related to helping society; more concerned with finding jobs that match their values rather than their skills.
CH	Pure challenge	Primarily motivated to overcome major obstacles, solve almost unsolvable problems, or win out over extremely tough opponents; define their careers in terms of daily combat or competition in which winning is everything; very single-minded and intolerant of those without comparable aspirations.
LS	Lifestyle	Primarily motivated to balance career with lifestyle; highly concerned with issues such as paternity/maternity leave, day-care options, etc.; looks for organisations that have strong pro-family values and programmes.

6.1.6 Illustration of individual–organisational career path congruence

This section illustrates the notion of applying the empirically tested I-PIA-M as a framework for guiding individual–organisational career path congruence.

The data collected from respondent E will be used as an example in this section.

- Biographical profile: race, age and gender
- Current career path/position
- Desired career path/position
- Current level of satisfaction with individual–organisational career path congruence

Career Construction Interview Core Career-Life Themes: Respondent E

During the career construction interview, the following life themes that influence career decision-making were identified:

- Building character as time goes along.
- Enjoys reading about political leaders (biographies) and the challenges they had to overcome to achieve success.
- Enjoys activities that challenge thinking capacity, involving some degree of adventure and uncertainty.
- Enjoys reading fiction such as Harry Potter, not particularly interested in biographies.
- Enjoys mathematics, life sciences and physics.
- In later years studied business management and marketing and enjoys working with numbers, and in marketing and communications.
- Originally wanted to study for a career in life sciences but as a result of financial constraints could not proceed at that point in time.
- Time with family important.
- At school enjoyed mathematics and physical science.
- Enjoys problem solving in general, especially scientific problem solving.

Based on the respondent's life themes, the following dominant career-related themes were derived:

- Enjoys challenges
- Applying cognitive capability
- Problem solving
- Enjoys mathematics, life sciences and physics

I-PIA-M Career Interests Profile: Respondent E

An example of the I-PIA-M career interests profile is presented in Figure 6.2 below (based on the data collected from respondent E):
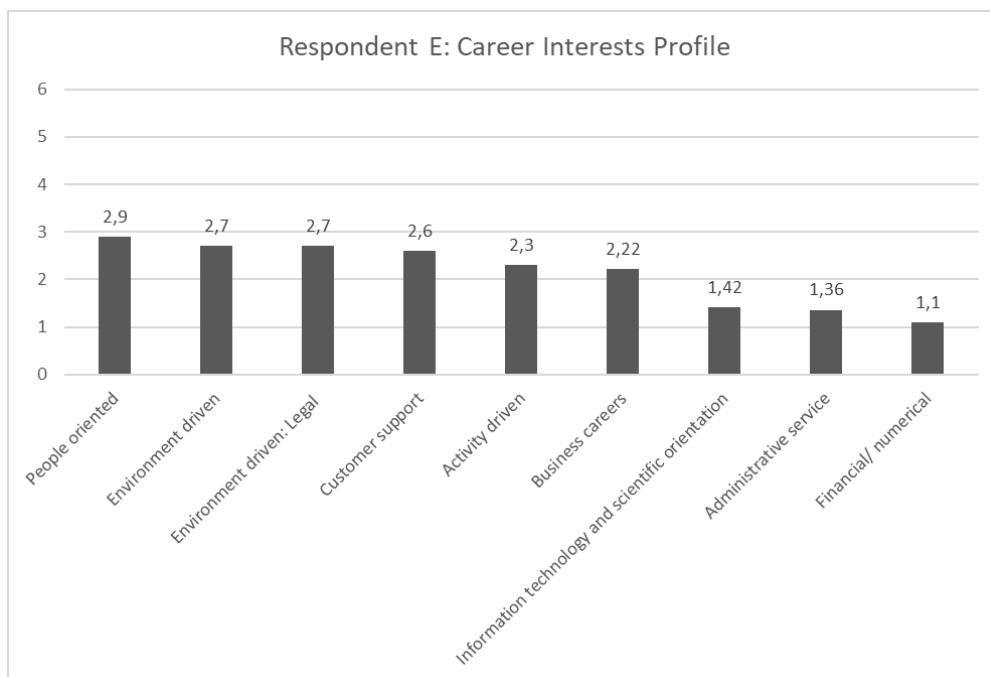
Figure 6.2 I-PIA-M Career Interests Profile (Respondent E)

Interest inventories that use Likert-type item response formats have response formats that require the endorsement of different interests, occupations, skills, and/or activities (Darcy & Tracey, 2003). Since this research follows the same format, threshold scores for low, moderate and high ranges were based on the strength of endorsement of the participant of the interests, ranking from high to low. The mean of the participant's scores was used as threshold for moderate scores. To gain insight into the difference in endorsement since scores reflect a close

level of comparison in endorsement, a decimal approach in calculation was applied to reflect the level of differentiation.

Items on career interests where high scores were recorded:

- Involved in the collecting, analysis and interpretation of data to determine the appeal of products and services
- Reviewing market trends, evaluating sales and proposing changes to the sales and marketing strategy of a business establishment
- I am a result-driven person and wish to influence my own progress towards predefined goals
- I always perceive myself as someone who has the ability to influence and persuade others
- Leading others towards greater levels of efficiency and productivity
- Developing an organisation by conducting market analysis and suggesting new directions and/or processes and/or activities
- Using computers with word processing programs to type letters, articles or documents
- Helping people and organisations to gain public acceptance by building and maintaining a favourable image.

I-PIA-M Career Abilities Profile: Respondent E

An example of the I-PIA-M abilities profile is presented in Figure 6.3 below (based on the data collected from respondent E):
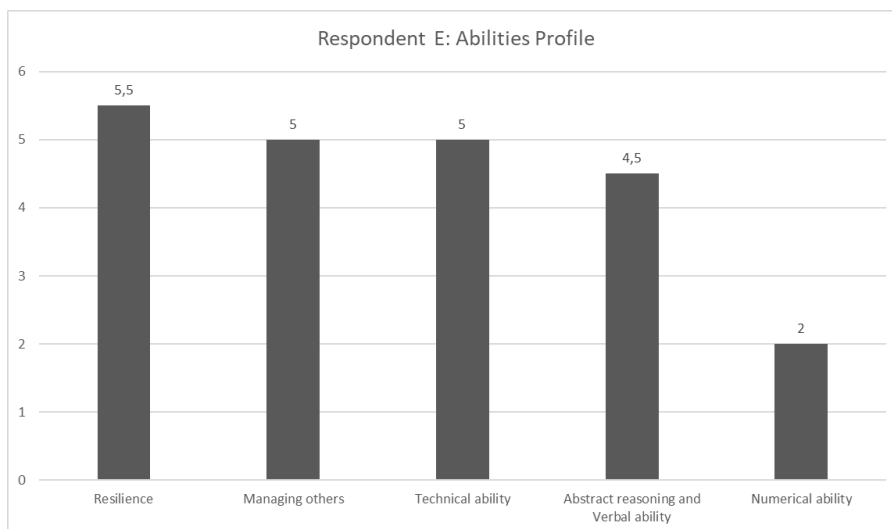

Figure 6.3 I-PIA-M Abilities Profile (Respondent E)

Similar as with career interests, threshold scores for low, moderate and high ranges were based on the strength of endorsement of the participant of the abilities, ranking from high to low. The mean of the participant's scores was used as threshold for moderate scores. To gain insight into the difference in endorsement since scores reflect a close level of comparison in endorsement, a decimal approach in calculation was applied to reflect the level of differentiation.

Items pertaining to self-perceived abilities where high scores were recorded:

- I am able to assemble facts, consider alternatives, and balance competing considerations before reaching the most appropriate solution(s)
- I am able to make decisions to improve the way I perform my tasks
- I cope well with stress, i.e. I am able to remain objective and calm in spite of difficult situations
- I find it easy to see the relationship between parts; to 'complete' the picture; to envisage the whole or end-result; to anticipate the outcome
- I find it easy to adapt and accept change; opposing views; new ideas
- I find it easy to listen and understand what has been spoken clearly and objectively
- I view myself as being courteous, diplomatic, comforting, respectful when attending to the problems or difficulties people experience
- I am able to collect, process, analyse and integrate into a relevant, factual outcome or conclusion
- I find it easy to evaluate and judge situations or alternative strategies, actions and outcomes against rational, logical assumptions
- I find it easy to convey information by means of written instructions in an accurate, concrete, clear, concise and understandable manner
- I have a good command of English and communicate effectively with all people at all levels of the organisation
- I find it easy to develop relationships with team members, which results in high performance and harmonious interactions
- I find it easy to organise and prioritise work in an effective and efficient manner
- I possess sufficient knowledge to perform effectively in own area of specialty
- I am able to deliver on my promises with the assumption that they were attainable and within my span of control

- I am able to lead others towards greater performance and efficiency by applying situational leadership theory and practice
- I can apply efficient and effective mechanisms to ensure a healthy work and personal life style
- In general, my stress control mechanisms allow me to recover with ease should I experience stress at regular intervals
- I believe I have sufficient self-control capacity when handling problems within my work and personal environment
- I am able to work with others in a constructive manner towards reaching a common goal and/or objective.

I-PIA-M Career Anchor Preferences Profile: Respondent E

An example of the I-PIA-M career anchor preferences profile (as measured by the COI) is presented is presented in Figure 6.4 below (based on the data collected from respondent E):
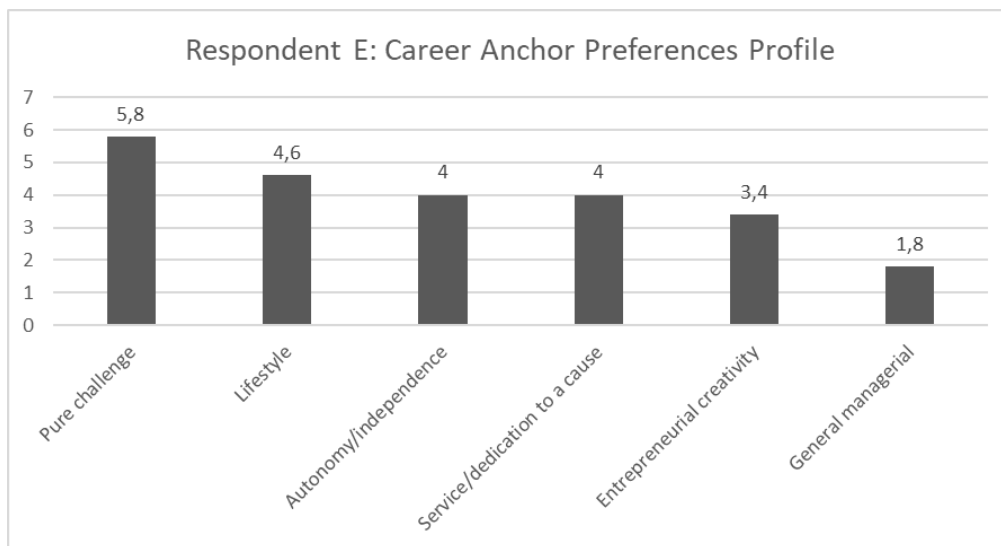
Figure 6.4 I-PIA-M Career Anchor Preferences Profile (Respondent E)

Similar as with career interests and abilities, threshold scores for low, moderate and high ranges were based on the strength of endorsement of the participant of the career anchor preferences, ranking from high to low. The mean of the participant's scores was used as threshold for moderate scores. To gain insight into the difference in endorsement since scores reflect a close

level of comparison in endorsement, a decimal approach in calculation was applied to reflect the level of differentiation.

The following are the most dominant career anchor preferences that appear to predict respondent E's career needs:

- *Highest anchor (primary anchor): Pure challenge* [an indication that you seem to be primarily motivated to overcome major obstacles, solve almost unsolvable problems, or win out over extremely tough opponents; define your career in terms of daily combat or competition in which winning is everything; very single-minded and intolerant of those without comparable aspirations]

The following anchor represents your second highest anchor (secondary anchor) and should be considered in conjunction with the primary anchor:

- *Lifestyle:* You appear to be motivated to balance career with lifestyle; highly concerned with issues such as paternity/maternity leave, day-care options, etc.; look for organisations that have strong pro-family values and programmes.

The following anchors represents your third highest anchor (tertiary anchors) and should be considered in conjunction with the above:

- *Autonomy/Independence:* You appear to seek work situations which are maximally free of organisational constraints; want to set own schedule and own pace of work; are willing to trade off opportunities for promotion in order to have more freedom.
- *Service/Dedication to a cause:* You appear to be motivated to improve the world in some fashion; want to align work activities with personal values related to helping society; more concerned with finding jobs that match your values rather than your skills.

Integrated summary of an I-PIA-M Profile: Respondent E

Table 6.10 summarises the outcomes of the I-PIA-M for respondent E.

Table 6.10

Integrated Summary of I-PIA-M Profile: Respondent E

Career anchor preferences	Pure challenge
	Lifestyle
	Autonomy/Independence; Service/Dedication to a cause
Career interests	People oriented
	Environment driven /Environment driven legal
	Customer support
Abilities (self-perceived)	Resilience
	Managing others / Technical ability
	Abstract reasoning and verbal ability
Career life themes	Enjoys challenges
	Applying cognitive capability
	Problem solving
	Enjoys mathematics, life sciences and physics
Proposed career clusters	Human resources
	Nursing/ medical sciences
	Specialist career path
Integration comment of significance	Although the individual reported a 3-letter code on the COI, in terms of the career preferences and ability profile on the I-PIA-M the individual fits the occupational/work environment through three RIASEC 3-letter codes, inferring multi-dimensional career pathways. Nursing/medical sciences is reflected as Holland Occupational Code ISA (investigative; social; artistic) for nursing, ISE (investigative, social, entrepreneurial) for medical related sciences (physician, general practitioner), whilst human resources is reflected as SEC (social; entrepreneurial; conventional), and financial services as ESC (entrepreneurial; social; conventional) (Gottfredson & Holland, 1996). Considering the level of congruence between the I-PIA-M career anchor preferences, career interests and abilities profile for the

	individual, and the Holland Occupational Codes (Gottfredson & Holland, 1996), the assumption can be made that the individual should be equally satisfied in following a career in a human resources, nursing/medical sciences and/or specialist career path.				

Although not part of the current research study, the respondent was requested to complete the IDEAS questionnaire (Interest Determination, Exploration and Assessment System) (Johansson, 2007) to verify his I-PIA-M inferred RIASEC profile against an already validated and reliable instrument (IDEAS Questionnaire) (Johansson, 2007). IDEAS is an interest assessment that identifies a person's interests and shows how those interests correspond to various occupations (IntoCareers, 2014). The IDEAS manual (IntoCareers, 2014) provides basic information regarding the development of IDEAS and the reliability and validity studies conducted on the assessment, however, some information (sample size, exact sample composition, data collection procedures) is absent. According to the manual, findings for score reliability on IDEAS have been positive, with alpha coefficients ranging from .80 to .90 for internal consistency on the sixteen scales ranged (IntoCareers, 2014). Respondent E's results on the IDEAS questionnaire are presented in Table 6.11.

Table 6.11

Results on the IDEAS Questionnaire: Respondent E

Holland	Interests	Total Score (A + B)		Holland	Interests	Total Score (C + D)
R	MECHANICAL FIXING (MEC)	14		S	COMMUNITY SERVICE (COM)	24
	PROTECTIVE SERVICES (PRO)	6			EDUCATING (EDU)	24
	NATURE/ OUTDOORS (NAT)	12			CHILD CARE (CHI)	19
I	MATHEMATICS (MTH)	4		E	PUBLIC SPEAKING (PUB)	23
	SCIENCE (SCI)	26			BUSINESS (BUS)	17
	MEDICAL (MED)	26			SALES (SAL)	15
A	CREATIVE ART (ART)	8		C	OFFICE PRACTICES (OFF)	13

WRITING (WRI)	22		FOOD SERVICE (FOO)	3

In order of significance, respondent E reported as follows in relation to the RIASEC theoretical framework, having completed the IDEAS Questionnaire: R (32); I (56); A (30); S (67); E (55); C (16). In terms of the RIASEC framework, respondent E's profile as a result of the IDEAS questionnaire is: SIERAC, thus his dominant 3-letter RIASEC profile is SIE. In the context of 'S', being involved in community service and education seems equally significant, as is engaging in scientific and/or medical activities in the context of 'I'. In terms of 'E', engaging in public speaking activities would seem to be significant, followed by business or enterprise-related activities. In terms of the RIASEC code application, careers with a high 'S' code involve, among others, helping others, consulting, education and community service, whilst an emphasis on 'I' includes analysis and problem solving. An emphasis on 'E' includes activities related to, for example, leadership roles in a business environment include the human resources management environment and/or medical profession such as general practitioner in the context of the individual's 3-letter profile.

In relation to the participant's career interests profile on the I-PIA-M (RIASEC inferred code S A/I E/S) it correlates with the IDEAS questionnaire. In terms of the abilities profile on the I-PIA-M, the participant reported an inferred RIASEC code of C E/S/R A/I/S. Since the abilities 3-letter code combinations include S,I and E it supports the correlation between the participant's career interests code and the IDEAS questionnaire.

The following was shared while completing of the I-PIA-M questionnaire, and confirmed during the career construction interview:

- *Current career path*: human resource consulting
- *Desired career path*: human resources; nursing/ medical sciences; specialist career path
- *General level of career satisfaction*: satisfied
- *General level of job satisfaction*: satisfied.
- Describe your employability (that is, you believe you have the attributes, skills, knowledge, experience and occupational expertise to create/attract employment with ease): Highly satisfied.

The respondent's career interests profile (people oriented; environment driven /environment driven legal and customer support) reported during the I-PIA-M supports both current career path (Human Resources Consultant) and desired career path (human resources; nursing/ medical sciences; specialist career path). The respondent's career anchor preferences profile (pure challenge; lifestyle; autonomy/independence; service/dedication to a cause) reported during the I-PIA-M supports both current career path (Human Resources Consultant) and desired career path (human resources; nursing/ medical sciences; specialist career path). The respondent's career life themes identified during the career construction interview (enjoys challenges; applying cognitive capability; problem solving; enjoys mathematics, life sciences and physics) supports both current career path (Human Resources Consultant) and desired career path (human resources; nursing/ medical sciences; specialist career path). From a P–E-fit perspective, a good level of congruence was established between the individual's current and desired career paths, and career interests, abilities and career anchor preferences profiles. This congruence was confirmed during the career construction interview.

The combination of quantitative and qualitative research to ascertain individual–organisation career path congruence allowed for both statistical and narrative (explanatory) insight to be gained in terms of the level of congruence between the individual's profile and career paths. The qualitative research provided an in-depth verification, exploratory and value-add element towards the attainment of an integrated approach to individual–organisation career path congruence.

6.2 EVALUATION OF PROPOSITIONS

In conclusion, and to integrate the qualitative research meaningfully, the various propositions are critically evaluated in terms of the findings.

6.2.1   Proposition 1

Individuals attach various meanings to their perceptions of their career interests which manifest as core life themes influencing person–organisational career path congruence.

The career interests' profiles of all individuals who participated in the qualitative study indicated multi-directional career paths, varying from working with people-related matters to financial/ numerical, people oriented, environment driven(legal), activity driven and customer support career paths on the I-PIA-M. At the time of the interviews, the individuals held positions such as personal assistant, human resource consultant, and nurse, with the personal assistant position

not being reported as desired career path by any respondent on the ICPA-M as presented in table 6.8.

In addition, candidates rated their career interests in the context of the various career paths with varying degrees of importance, resulting in a clear sequence of levels of interest reported. Of the five participants who participated in the qualitative study, three reported equal scores on more than one career interest. Two of the three participants reported a clear sequence of ratings in terms of career interests. As a result, the current organisational career paths of all three participants were included in desired organisational career paths. However, based on reported multi-directional career interests, in terms of desired organisational career paths, some elements of interests will be compromised, The remainder (two participants) reported high levels of incongruence between their respective three highest career interests (measured through the I-PIA-M and as manifested through core career life themes measured through the CCI) and current organisational career paths. In this instance, the current organisational career paths were not included in the respective desired organisational career paths.

Research cited earlier (Dik et al,2010), infer that one implication of this result is that although many individuals are likely to experience high congruence paired with low incongruence or low congruence paired with high incongruence, others may find that their job satisfies some of their strongest interests while simultaneously requiring them to engage in some tasks they may strongly dislike (high congruence, high incongruence), whilst others may experience relatively low levels of both congruence and incongruence.

In the context of this study. and in terms of career path congruence, the proposition that individuals attach various meanings to their perceptions of their career interests which manifest as core life themes influencing person–organisational career path congruence is accepted.

6.2.2 Proposition 2

Individuals attach various meanings to their perceptions of their abilities which manifest as core life themes influencing person–organisational career path congruence.

Participants rated their abilities in the context of the various abilities assessed by the I-PIA-M (i.e. abstract reasoning and verbal ability, managing others, resilience, numerical ability and technical ability) with varying degrees of importance, resulting in a clear sequence of level of ability reported. Of the five participants who participated in the qualitative study, one reported an equal score on more than one ability, whilst four participants reported a clear sequence of ratings in terms of self-perceived abilities. The results support multidirectional career path related abilities as reported by the abilities profile of the I-PIA-M. Note that the individual who reported the multidirectional abilities profile also reported a similar pattern in relation to the career interests' profile.

In terms of abilities, and in the context of the qualitative study, two of the five participants reported high levels of incongruence between their respective three highest abilities (measured through the I-PIA-M and as manifested through core career life themes measured through the CCI) and current organisational career paths. In this instance, the current organisational career paths were not included in the respective desired organisational career paths. Three of the five participants reported an acceptable level of congruence with their respective three highest abilities (measured through the I-PIA-M and as manifested through core career life themes measured through the CCI) and current organisational career paths. As a result, their current organisational career paths were included in desired organisational career paths. However, based on reported multi-directional career paths in terms of desired organisational career paths, some elements of abilities will be compromised.

In the context of this study. and in terms of career path congruence, the proposition that individuals attach various meanings to their perceptions of their abilities which manifest as core life themes influencing person–organisational career path congruence is accepted.

6.2.3 Proposition 3

Individuals attach various meanings to their perceptions of their career anchor preferences which manifest as core life themes influencing person–organisational career path congruence.

Participants rated their career anchor preference profiles of the I-PIA-M in the context of the various career anchors assessed (i.e. general managerial, autonomy/independence, entrepreneurial creativity, service/dedication to a cause, pure challenge, and lifestyle), with varying degrees of importance, resulting in a clear sequence of endorsed scores reported. Of the five participants who participated in the qualitative study, three reported equal scores on more than one career anchor preference, whilst two participants reported a clear sequence of ratings. The results support the notion of multidirectional career paths. Note that the individuals who reported similar patterns for the multidirectional career interests' profile and the abilities profile, reported a similar pattern for the career anchor preferences profile.

In terms of career anchor preferences, and in the context of the qualitative study, two of the five participants reported high levels of incongruence between their respective three highest career anchor preferences (measured through the COI as part of the I-PIA-M and as manifested through core career life themes measured through the CCI) and current organisational career paths. In this instance, the current organisational career paths were not included in the respective desired organisational career paths. Three participants reported an acceptable level of congruence with their respective three highest career anchor preferences (measured through the COI as part of the I-PIA-M and as manifested through core career life themes measured through the CCI) and current organisational career paths. As a result, their current organisational career paths were included in desired organisational career paths. However, based on reported multi-directional career paths in terms of desired organisational career paths, some elements of career anchor preferences will be compromised.

In the context of this study. and in terms of career path congruence, the proposition that Individuals attach various meanings to their perceptions of their career anchor preferences which manifest as core life themes influencing person–organisational career path congruence is accepted.

6.2.4   Proposition 4

Individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences (as measured by the I-PIA-M) which manifest as core life themes influencing person–organisational career path congruence.

Participants rated their I-PIA-M career interests, abilities and anchor preferences profiles in the context of the various career interests, abilities and career anchors assessed with varying degrees of importance, resulting in a clear sequence of level of interest, ability and career anchor preferences being reported.

Of the five participants who participated in the qualitative study, three reported equal scores on more than one career interest, with these same individuals reporting similar patterns for their respective abilities and career anchor preferences profiles. Two participants reported a clear sequence of ratings in terms of career interests, abilities and career anchor preferences. In addition, congruence was reported between all participants' career interests, abilities and career anchor preferences and their current and desired career paths.

The results support multidirectional career path interests as reported by the career interests, abilities and career anchor preferences profile of the I-PIA-M. Note that the same participants who reported similar patterns for the multidirectional career interests profile and the abilities profile, also reported similar patterns for the career anchor preferences profile.

In terms of career anchor preferences, career interests and self-perceived abilities in the context of the qualitative study, and as manifested in career life themes, all participants reported significant levels of congruence between their respective career anchor preferences (measured through the COI as part of the I-PIA-M), career interests (measured through the I-PIA-M), self-perceived abilities (measured through the I-PIA-M) and career life themes (measured through the CCI). However, two participants reported incongruence between their respective three highest scores on each construct of the I-PIA-M (career anchor preferences, career interests, abilities and as manifested in career life themes measured through the CCI) and current organisational career paths. In this instance, the current organisational career paths were not included in the respective desired organisational career paths. The remainder (three participants) who participated in the qualitative study reported an acceptable level of congruence with their respective three highest scores on each construct of the I-PIA-M (career anchor preferences, career interests, abilities and

as manifested in career life themes measured through the CCI) and current organisational career paths. As a result, their current organisational career paths were included in desired organisational career paths. However, based on reported multi-directional career paths in terms of desired organisational career paths, some elements of career anchor preferences, career interests, abilities and as manifested in the career life themes will be compromised.

Research cited earlier Chuang (2013), noted that P–E fit is faced with the various challenges and that researchers should also consider the multiple content dimensions of each individual dimension of P–E fit. In the context of this study, scores of career anchor preferences, career interests, abilities and how it manifests in career life themes were considered in the context of current, and desired organisational career paths.

In the context of this study. and in terms of career path congruence, the proposition that individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences (as measured by the I-PIA-M) which manifest as core life themes influencing person–organisational career path congruence is accepted.

6.2.5   Proposition 5

Individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences (as measured by the I-PIA-M), and the career-life themes elicited from the career construction interview which manifest as core life themes influencing person–organisational career path congruence

Participants rated their I-PIA-M career interests, abilities and anchor preferences profiles, in the context of the various career interests, abilities and career anchor preferences assessed, with varying degrees of importance, resulting in a clear sequence of level of interest, ability and career anchor preferences being reported. Of the five participants in the qualitative study, three reported equal scores on the I-PIA-M for more than one career interest, with the same individuals reporting a similar pattern for their respective abilities and career anchor preferences profiles. Two of the participants reported a clear score sequence in terms of career interests, abilities and career anchor preferences.

Although alignment of current career paths and desired career paths could be predicted based on the individuals' career interests, abilities, and career anchor preferences profiles, the qualitative study was enhanced by insights gained from the career construction interview. The

purpose of the interviews was to identify most prominent life themes that could influence career path decision-making and to verify the analysis of current career paths and the predictability of desired career paths identified during the application of the I-PIA-M.

Regarding participants A, B and D, a reported correlation was found between the most prominent life themes and the integrated results of the I-PIA-M, namely, career interests, abilities and career anchor preferences profile. Respondent C's most prominent life themes reported a stronger orientation towards the abilities and career anchor preferences profiles than towards the respondent's career interests profile. However, since the abilities and career anchor preferences support the respondent's current and desired career paths, the relationship with the life themes identified during the career construction interview is evident. Respondent E's most prominent life themes show a clear relationship with the respondent's abilities and career anchor profiles, and an inferred relationship with the respondent's career interests profile. Respondent E's most prominent life themes thus relate to both the current and the desired career paths.

In terms of career anchor preferences, career interests and self-perceived abilities in the context of the qualitative study, and as manifested in career life themes, all participants reported significant levels of congruence between their respective career anchor preferences (measured through the COI as part of the I-PIA-M), career interests (measured through the I-PIA-M), self-perceived abilities (measured through the I-PIA-M) and career life themes (measured through the CCI). The conclusion is reached that the Career Construction Interview provides a better understanding of an individual's current and desired career path predictability and assists in clarifying tendencies diagnosed during the quantitative results analysis of the I-PIA-M.

Overall, the proposition that individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences (as measured by the I-PIA-M), and the career-life themes elicited from the career construction interview which manifest as core life themes influencing person–organisational career path congruence is accepted.

6.3 SYNTHESIS AND EVALUATION

The current research followed a mixed-method approach in order to achieve the aims of the research. While Chapter 5 reported on the quantitative research results, which involved testing the reliability and validity of the integrated career anchor preferences, career interests and abilities scale (I-PIA-M), the purpose of Chapter 6 was to apply the I-PIA-M in practice to explore the

measure's usefulness in guiding individual–organisational career path congruence in the South African organisational context. Hence, Chapter 6 reported the results of the qualitative study included in the mixed approach to the empirical study.

Of the five participants who participated in the qualitative study, two reported a clear sequence of ratings in terms of career interests, abilities and career anchor preferences, while three individuals reported equal scores for more than one career interests, abilities and career anchor preferences, with the same individuals having reported this tendency. Overall, there was reported congruence between all the participants' career interests, abilities and career anchor preferences and their current and desired career paths.

In addition, the career construction method was applied to give further insight into person–organisational career path congruence and to verify the findings of the I-PIA-M.

Moreover, the profile of one of the participants' (respondent E) was discussed in detail, providing a case study for giving further insight into the outcome of the overall I-PIA-M and Career Construction interview from the perspective of person–organisational career path congruence. An existing instrument, the IDEAS Questionnaire (Johansson, 2007), was applied to the case study respondent to verify the outcome of the results of the I-PIA-M, as well as an existing valid instrument based on Holland's personality and occupational types theory (Gottfredson & Holland, 1996).

Based on the qualitative study, the following propositions were confirmed:

Proposition 1: Career interests

The proposition that individuals attach various meanings to their perceptions of their career interests, which then manifest as core themes influencing person–organisational career path congruence, was confirmed.

The career interests profiles of all the individuals who participate in the qualitative study indicated multidirectional career paths, varying from working with people-related matters to financial/ numerical, people oriented, environment driven (legal), activity driven and customer support career paths on the I-PIA-M. The results thus indicated multidirectional career path interests. Participants reported a clear sequence of ratings in terms of career interests, with three participants reporting multidirectional career paths.

Proposition 2: Abilities

The proposition that individuals attach various meanings to their perceptions of their abilities, which manifest as core themes influencing person–organisational career path congruence, was confirmed.

Participants rated their abilities in the context of the various abilities included in the I-PIA-M (i.e. abstract reasoning and verbal ability, managing others, and numerical ability) as having varying degrees of importance, resulting in a clear sequence of level of ability being reported. This was confirmed by the results of the career construction interview. Participants reported a clear sequence of ratings in terms of career interests, with three participants having reported abilities to support multidirectional career paths.

Proposition 3: Career anchor preferences

The proposition that individuals attach various meanings to their perceptions of their career anchor preferences, which manifest as core themes influencing person–organisational career path congruence, was confirmed.

Participants rated their career anchor preferences profiles of the I-PIA-M in the context of the various career anchors assessed (i.e. general managerial, autonomy/independence, entrepreneurial creativity, service/dedication to a cause, pure challenge, and lifestyle) with varying degrees of importance, resulting in a clear sequence of level of ability being reported. This was confirmed by the results of the career construction interview. Participants reported a clear sequence of ratings in terms of career interests, with three participants having reported abilities to support multidirectional career paths.

Proposition 4: Integrated career interests, abilities and career anchor preferences

The proposition that individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences, which manifest as core themes influencing person–organisational career path congruence, was confirmed.

Participants rated their I-PIA-M career interests, abilities and anchor preferences profiles in the context of the various career interests, abilities and career anchor preferences assessed with varying degrees of importance, resulting in a clear sequence of level of interest, ability and career anchor preferences being reported. This was confirmed by the results of the career construction

interview. Congruence was reported between all individuals' career interests, abilities and career anchor preferences and their current and desired career paths. The results support multidirectional career path interests as reported by the career interests, abilities and career anchor preferences profile of the I-PIA-M. Note that the same individuals who reported similar patterns for the multidirectional career interests profile and the abilities profile, also reported similar patterns for the career anchor preferences profile.

Proposition 5: Integrated career interests, abilities and career anchor preferences and the life themes elicited from the career construction interview

The notion that individuals will report congruence between their self-perceived career interests, abilities and career preferences and the career-life themes elicited from the career construction interview, which manifest as core themes influencing person–organisational career path congruence, was confirmed.

Although alignment of current career paths and desired career paths could be predicted based on the individuals' career interests, abilities and career anchor preferences profiles, the qualitative study was enhanced using insights gained from the career construction interview. The purpose of the interviews was to identify the most prominent life themes that could influence career path decision-making, and to verify the analysis of the current career paths and the predictability of the desired career paths that were identified during the application of the I-PIA-M. It is therefore concluded that the career construction interview provides clear insights for obtaining a better understanding of an individual's current and desired career path predictability and for clarifying tendencies diagnosed during the results analysis of the I-PIA-M. Therefore, such interviews should be considered value-added applications for use in conjunction with the I-PIA-M in the career-counselling context.

Overall, the results of the qualitative study support the qualitative evidence of all hypotheses stated in Chapter 5 (Research results: quantitative study).

The next chapter (Chapter 7: Discussion, conclusions, limitations and recommendations) will discuss the results reported in Chapter 5 (quantitative study) and in Chapter 6 (qualitative study). The conclusions are also presented in this chapter, followed by a critical evaluation of the limitations of the research design and recommendations for future research and career development guidance practice.

6.4 CHAPTER SUMMARY

This chapter aimed to report on the results of the qualitative research in terms of the methodology criteria defined in Chapter 4.

Research aim 4 was to apply the empirically validated integrated career anchor preferences, career interests and abilities scale (I-PIA-M) in practice to assess individual–organisational career path congruence in the South African organisational context. Accordingly, Chapter 6 aimed to address the propositions made for the qualitative study in Chapter 4.

For context, the I-PIA-M results of the participants (N = 5) who participated in the qualitative study were analysed and reported in terms of the various subscales of the I-PIA-M (career anchor preferences, career interests and abilities). The focus was aligned to the final factors retained for statistical analysis during the quantitative study in order to promote the correlation of the results of the quantitative and the qualitative studies. It was subsequently found that the results of the qualitative study support multidirectional career patterns such as those reported by the quantitative study in Chapter 5.

The qualitative study entailed conducting a career construction interview with each respondent in order to identify career themes, subsequently integrating the themes with the results of the I-PIA-M and relating them back to Holland's (1997) personality and occupational types theory as depicted in the RIASEC framework to identify current and future ideal career paths for the participants. In addition, educational and industry career path frameworks (discussed in Chapter 2) were considered to inform organisational career pathways. To enrich the qualitative research, one respondent was randomly selected to complete the IDEAS questionnaire (Johansson, 2007). The results of the IDEAS questionnaire were compared with the participants' results on the I-PIA-M and a significant degree of congruence was established to confirm face validity in terms of the abilities profile of the respondent (case study). No statistical analysis was performed to compare the IDEAS and the I-PIA-M, as the IDEAS questionnaire was used for I-PIA-M career theme validation and not for conducting an instrument correlation exercise.

As a result of the qualitative study, Chapter 6 provided valuable insights that were formulated and presented in proposition format in order to integrate the qualitative research meaningfully and illustrate its relevance for research aim 4 of the empirical research. Furthermore, a synthesis and evaluation of the qualitative research was provided to confirm the various meanings individuals

attach to their perceptions of their career anchor preferences, career interests and abilities in the context of their respective career life themes. These themes were identified during the career construction interview and manifest as core themes influencing person–organisational career path congruence.

The next chapter (Chapter 7: Discussion, conclusions, limitations and recommendations) will discuss and interpret the findings of this research and make practical recommendations for industrial psychologists based on the findings.

Research aim 5 is addressed in chapter 7.

CHAPTER 7

DISCUSSION, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter discusses and explains the results reported in Chapter 5 (quantitative study) and in Chapter 6 (qualitative study). The chapter starts by presenting the conclusions followed by a critical evaluation of the limitations of the research design. It concludes by making a number of recommendations for future research and for career development guidance and counselling practice.

7.1 DISCUSSION

The general aim of this research was to develop an integrated career anchor preference, career interests and abilities measurement scale (I-PIA-M) in order to guide individual–organisational career path congruence. Individual–organisational career path congruence refers to the alignment of an individual's career interests, abilities and career anchor preferences with the career path requirements defined by the world of work. In investigating the theoretical relationship between career anchor preferences, career interests and abilities and the way in which these constructs relate to individual–organisational career path congruence, an understanding of the notion of person–environment (P–E) fit is critical. The research was supported by research cited in chapter 3 supporting the notion that people seek out and create environments that allow them to manifest their traits behaviourally, and the extent to which people fit their work environments through an alignment between personality and occupational types, supporting the notion of correspondence between person and work environment fit has significant consequences with better fit being associated with better outcomes (Dawis & Lofquist, 1993; Holland, 1997; Su et al., 2015). Existing research confirms the importance of career anchor preferences, career interests and ability profiles relevant to occupational frameworks, limited research exists in terms of applying the three constructs in an integrated manner to support person-organisational career path congruence.

In the South African context, little or no evidence could be found relating to the link between career anchor preferences, career interests and ability profiles to the various occupational classifications frameworks and models discussed under chapter 2 since the focus of these classifications, frameworks and models is work centric and does not necessarily consider person-centric profiles to guide alignment in terms of P–E career congruence. The aim of the I-PIA-M is to explore the feasibility of applying an integrated measure of constructs (career anchor preferences, career

interests and abilities) that helps guide individual–organisational career path congruence in the career counselling context.

Overall, the quantitative study and qualitative study corroborate the importance of integrating different fit theories in order to gain a richer profile of person-variables (i.e. career anchor preferences, career interests and abilities) that influence perceptions of career path congruence (see for example Chuang, 2013; Kristof-Brown & Guay, 2011). The study addressed a core challenge highlighted by previous research on person-environment fit, namely to study person-organisation fit from a multidimensional perspective (Chuang, 2013). The development of the I-PIA-M integrated the dimensions of person-environment fit as discussed under the TWA/P-E Correspondence section in chapter 3. The empirical study (as corroborated by the qualitative study) provided evidence that that fit for career path congruence should be considered holistically in research and practice (Darrow & Behrend, 2017). A central thesis in P-E fit theories is that comparisons between an assessment of the individual and an assessment of his or her environment can predict positive workplace performance outcomes (Nye et al, 2017).

In addition, the application of the I-PIA-M in practice, allowed the researcher to further investigate the face validity of the notion of multidimensionality of P-E fit (Chuang, 2013) as well as the unique effects of each P-E fit theory (as measured by the I-PIA-M subscale variables) on individuals' perceptions of career path congruence. In this regard, the study contributed valuable new knowledge and insight to P-E fit theory as applied in the career path congruence guidance context.

7.1.1 Psychometric properties of the I-PIA-M

Career path congruence refers to the alignment between career anchor preferences, career interests, perceived abilities and organisational expectations represented by means of world of work career maps which incorporates Holland's (1997) RIASEC categories. In terms of career interests, Holland (1985, 1997) claimed that professional satisfaction, diligence and success depend on the congruence between an individual's personality and their occupation or field of study. This research is thus extended to include career anchor preferences and abilities together with career interests to explore the role these concepts play in career path congruence in a valid and reliable manner.

The I-PIA-M was designed to measure the elements of career anchor preferences, career interests and abilities and mapping these on the RIASEC occupational categories/organisational

pathways outlined by the WWM (Prediger, 2002). The integrated I-PIA-M scale included the items and scales of the original Career Orientations Inventory (COI) (Schein, 2006), as well as two new subscales (career interests and abilities) that were developed based on Holland's (1997) RIASEC types.

The research results demonstrated the multidimensionality and internal consistency reliability of the I-PIA-M. The results also provided evidence of both convergent and discriminant validity of the I-PIA-M. Thus, in essence, the results signified the potential value of the I-PIA-M as a useful instrument in measuring multidimensional aspects of P-E fit (Chuang, 2013; Kristof-Brown & Guay, 2011) in career path congruence guidance.

The application of the I-PIA-M suggests that career anchor preferences and career interests remain important aspects of person-vocation congruence, while abilities remain important for person-job congruence. Integrated as a multidimensional measure of P-E fit, the three constructs are important to consider person-organisation- or career path congruence. The findings corroborate previous research highlighting the importance of considering aspects of complementary fits in career path congruence guidance (Van Vianen, 2018).

In terms of career anchor preferences, following the EFA, the following career anchor preferences are measured by the I-PIA-M in terms of person-vocation congruence:

- *General managerial competence* – primarily excited by the opportunity to analyse and solve problems under conditions of incomplete information and uncertainty; likes harnessing people together to achieve common goals; stimulated (rather than exhausted) by crisis situations.
- *Autonomy/independence* – primarily motivated to seek work situations that are maximally free of organisational constraints; wants to set own schedule and own pace of work; is willing to trade off opportunities for promotion in order to have more freedom.
- *Entrepreneurial/creativity* – primarily motivated by the need to build or create something that is entirely their own project; easily bored and likes to move from project to project; more interested in initiating new enterprises than in managing established ones.
- *Service/dedication to a cause* – primarily motivated to improving the world in some fashion; wants to align work activities with personal values related to helping society; more concerned with finding jobs which meet their values than their skills.
- *Pure challenge* – primarily motivated to overcome major obstacles, solve almost unsolvable problems, or win out over extremely tough opponents; define their careers in terms of daily

combat or competition in which winning is everything; very single-minded and intolerant of those who lack comparable aspirations.

- *Lifestyle* – primarily motivated to balance career with lifestyle; highly concerned with such issues as paternity/maternity leave, day-care options, and the like; looks for organisations that have strong pro-family values and programmes.

In terms of career interests, following the EFA, the following interests are measured by the I-PIA-M in terms of person-vocation congruence:

- *Activity driven (related to realistic (R))*– Physical activities are performed, often equipment and vehicles are operated/controlled, and complex/technical activities are accomplished as job outputs
- *Administrative service (related to conventional (C))*– Supporting business operations by delivering routine, complex and specialised administrative duties in accordance with predefined processes and procedures
- *Business careers (related to entrepreneurial (E))* – Business careers involve managing a business, project or production processes, and developing and implementing business processes and plans. Advertising, marketing and the sale of goods and/or services to customers are included in this career field. It often involves managing, motivating and leading staff
- *Customer support (related to entrepreneurial (E) and social (S))* – Customer support involves helping customers efficiently, in a friendly manner. It is the act of taking care of the customer's needs by providing and delivering professional, helpful, high quality service and assistance before, during, and after the customer's requirements are met
- *Environment driven: Legal (related to entrepreneurial (E), Social (S) and investigative (I))* – Legal professionals study, develop and apply law. In a corporate context, the focus of the legal professional is to determine and ensure that all business practices, policies and procedures meet regulatory requirements, and to advise the business on how to protect legal interests.
- *Financial/numerical (related to entrepreneurial (E))*– People interested in a career involving finances/working with numbers, have the need to work with figures, making simple and complex calculations in solving problems of a various nature. Typically, they are well organized individuals with well-developed analytical and problem-solving skills and an eye for

283

detail. In order to succeed in this field of work an above average ability in Mathematics is required

- *Information Technology and scientific orientation (related to investigative (I) and realistic (R))*– People interested in a career involving Computers or Information technology, have the need to work with complex data in either raw or final format. Typically, they are well organized individuals with well-developed analytical and problem-solving skills. People interested in a career in the Sciences have an investigative mind, approaching matters and issues from a scientific perspective, with well-developed analytical and problem-solving skills and an eye for detail. They have the need to collect, collate data, analyse it, interpret and report on findings, providing others with their valuable conclusions. They tend to apply logical thinking in a more informal, yet procedure-controlled environment.

- *People oriented (related to social (S))* – Careers involve working with, communicating with, and teaching people. These occupations often involve helping or providing service to others.

In terms of ability, following EFA, the following self-perceived abilities are measured by the I-PIA-M in terms of person-vocation congruence:

- *Abstract reasoning and Verbal ability (related to artistic (A) investigative (I) and social (S))* - the ability to use diagrams, symbols or shapes instead of words or numbers – it involves identifying the underlying logic and then determining the solution. In addition, it includes the ability to evaluate the logic of various kinds of arguments.

- *Managing others (related to enterprising (E) and social (S))* – the ability to manage and encourage people, optimise their outputs and effectively manage relationships in order to achieve agreed goals

- *Numerical ability (related to realistic (R)* – the ability to make correct decisions or inferences from numerical data. The tasks set and data presented are highly relevant to a range of careers.

Overall, the results confirmed the RIASEC framework of Holland (1985) as an important and valuable framework to consider in P-E fit evaluation for career path congruence guidance. According to Hansen (2013) and Nauta (2013), Holland's theory provides a comprehensive model of vocational interests and their relationship to career decision-making, satisfaction and performance. The present study extends research by showing that the RIASEC model can be extended to include abilities as an aspect of person-job congruence in order to achieve greater person-organisation congruence.

7.1.2 Biographical variables as predictors of the I-PIA-M variables

The race/gender ecological model of career development, as espoused in Cook, Heppner and O'Brien's race/gender ecological theory (Gysbers et al., 2003), recognises that by their very nature, humans live interactionally in a social environment. The model posits that every person has both a gender and a race and that these factors decisively shape the individual's career throughout life, as she or he encounters opportunities or obstacles because of race or gender. Although individuals of the same biological sex or race may encounter similar circumstances because of their demographics, every career path is unique because of individual circumstances, and the unique interactions of the various subsystems (Gysbers et al., 2003). The conclusion can therefore be drawn that from a theoretical perspective factors relating to gender and race influence careers, either by presenting opportunities or obstacles; these are therefore deemed to be important factors in the study of person–career path congruence. Super's (1992) life stages confirms the relevance of age towards career choices. A study conducted by Baglama and Uzunboylu (2017) reported that age significantly relates to career decision-making self-efficacy.

In the context of this research, stepwise multiple regression analysis with backward elimination using SAS version 9.4 (SAS, Inc., 2013) was performed to test whether race, gender and age significantly predicted the career anchor preferences, career interests and abilities of individuals. The results showed that race and gender contributed to explaining the variance in career interests but not in terms of abilities and contributed to explain the variance in some career anchor preferences. Age did not contribute to explain the variance in career interests and contributed to explain the variance in one of the abilities and career anchor preferences respectively. This study did not, however, investigate the level of impact of gender, age and race sufficiently and it is therefore recommended that further research be conducted explore the impact of this factor so as to establish the underlying reasons for the statistical results.

7.1.3 Differences among age, race, gender groups

The results of the study as reported in chapter 5 shows that black and white participants differed significantly on all the career interests, with black participants scoring significantly higher than their white counterparts on various variables. In terms of abilities, the results show that Black and White participants did not differ significantly on all the abilities. Black and white participants differed significantly on some of the career anchor preferences, with black participants scoring significantly higher than their white counterparts on various career preferences.

In the context of the study, the result supports the conclusion that race represents a factor in person-career path congruence.

In terms of career interests, male and female participants differed significantly on all the career interests, with male participants scoring significantly higher than their female counterparts on various variables. Male and female participants differed significantly on some of the abilities, with male participants scoring slightly higher than their female counterparts on these abilities. Male and female participants differed significantly on some of the career anchor preferences, with male participants scoring significantly higher than their female counterparts on these career preferences.

In the context of the study, the result supports the conclusion that gender represents a factor in person-career path congruence.

In terms of age, the results showed no significant difference in terms of career interests, with only differences in terms of abstract reasoning ability and the career anchor preference of autonomy/independence. In the context of the study, the result supports the conclusion that age did not significantly represent a factor in person-career path congruence. Note that broad age group ranges were applied during this study that may have influenced the level of significance reported during this study.

7.1.4 Application of the I-PIA-M in individual–organisational career path guidance

This section reflects critically on the various propositions made in Chapter 6.

The quantitative study provided evidence of the construct validity and internal consistency reliability of the I-PIA-M. The I-PIA-M was therefore applied in practice (qualitative study) to explore its functionality in exploring individual–organisational career path congruence in terms of:

- The functionality of career anchor preferences in guiding individual-organisational career path congruence
- The functionality of career interests in guiding individual-organisational career path congruence
- The functionality of abilities in guiding individual-organisational career path congruence

As evident from propositions, which are repeated below, the I-PIA-M showed good face validity in terms of the RIASEC and IDEAS, the O*NET System and the World of Work Map (WWM).

The following propositions are explained:

Proposition 1: Individuals attach various meanings to their perceptions of their career interests which manifest as core themes influencing person–organisational career path congruence.

The career interests profiles of all individuals participating in the study indicated multidirectional career paths, with a clear sequence of ratings in terms of career interests. In terms of Holland's theory, the most important aspect is that of congruence (Nauta, 2013). Thus, individuals will tend to seek environments that fit well with their skills and abilities and within which they can express their attitudes and values (Nauta, 2013). The contemporary environment reflects change and is dynamic and fluid and, thus, careers are more unpredictable, vulnerable and multidirectional than ever before (Baruch, 2006).

Proposition 2: Individuals attach various meanings to their perceptions of their abilities which manifest as core themes influencing person–organisational career path congruence.

The results support multidirectional career path interests as reported by the career interests profile of the I-PIA-M, with a clear sequence of ratings in terms of self-perceived abilities. Apart from values (which were excluded from this research), the WWM considers work-relevant abilities and interests to be primary considerations when assisting individuals with career exploration and planning (Prediger, 2002). Holland's (1997) personality and occupational types theory, on the other hand, provides a comprehensive model of vocational interests and their relationship to career decision-making, satisfaction and performance. In this context, it also provides a framework for integrating higher-order abilities, personality, values, interests and needs, and for describing interests relative to people, work environments and job tasks (Hansen, 2013), thus emphasising the importance of alignment between career interests and abilities from a career planning perspective. Accordingly, the qualitative study clearly indicated the alignment between career interests and abilities to guide desirable career paths.

Proposition 3: Individuals attach various meanings to their perceptions of their career anchor preferences which manifest as core themes influencing person–organisational career path congruence.

Accordingly, to Bravo et al. (2017), Schein's (1978, 1990) model assumes that an individual will have a dominant anchor and not multiple anchors. Questions raised by Bravo et al. (2017) include whether an individual can hold more than one anchor. Feldman and Bolino (1996) argue that individuals can have multiple career anchors of differing intensity and that the significance of any one anchor may change over time as a result of new experiences and challenges.

The results support multi-directional career path interests as reported by the career anchor preferences profile of the I-PIA-M, with a clear sequence of ratings in terms of career anchor preferences.

Proposition 4: Individuals will report congruence between their self-perceived career interests, abilities and career anchor preferences which manifest as core themes influencing person–organisational career path congruence.

Participants rated their I-PIA-M career interests, abilities and anchor preferences profiles with varying degrees of importance, resulting in a clear sequence of level of interest, ability and career anchor preferences reported. The results support multi-directional career path interests as reported by the career interests, abilities and career anchor preferences profile of the I-PIA-M. Career anchor preferences as represented through Schein's (1990; 2006) career anchors serve as a guide to individuals when making career decisions. Career pathways (such as the Minnesota Career Fields, Clusters & Pathways chart, Occupational Information Network [O*NET Centre, 2007] and the WWM [Prediger, 2002]) provide a clear roadmap for individuals in pursuit of careers that are appropriate to their career anchor preferences, career interests and abilities. Person-career path congruence was confirmed by the qualitative study (incorporating the quantitative data derived from the I-PIA-M, and the career construction interview). In all instances, as reported in chapter 6, including the comprehensive case study, respondent reported results, compared with the RIASEC and WWM, explained perceptions of person-career path congruence in terms of desired organisational career paths. The desired organisational career paths predicted by the I-PIA-M corresponded with the CCI career life themes in all instances.

According to Holland (1973), career interests are primarily used to predict individuals' initial career choices and not specialty choices. In addition, they are associated with career anchors because both anchors and interests are stable constructs stemming from individual personalities and identities. Leong et al. (2014) reported strong interrelatedness between the factors of Schein's (1990; 2006) career anchor preferences and Holland's (1973) career interest typology. Tims et

al.'s (2011) research findings suggest that by seeking an alignment between their career anchor preferences, career interests and abilities and organisational and job requirements, individuals can proactively optimise their person–job congruence and, as a consequence, experience their work as meaningful.

Proposition 5: Individuals will report congruence between their self-perceived career interests, abilities and career preferences, and the career-life themes elicited from the career construction interview, which manifest as core themes influencing person–organisational career path congruence.

Although the alignment of current career paths and desired career paths may be predicted based on the individuals' career interests, abilities and career anchor preferences profiles, the qualitative study was enhanced through insights gained from the career construction interview. The purpose of the interviews was to identify the most prominent life themes of participants which could influence career path decision-making, and to verify the analysis of the current career paths and the predictability of the desired career paths identified during the application of the I-PIA-M. Person-career path congruence was confirmed by the qualitative study (incorporating the quantitative data derived from the I-PIA-M, and the career construction interview). In all instances reported in chapter 6, including the comprehensive case study, respondent reported results, compared with the RIASEC and WWM, predicted person-career path congruence in terms of desired organisational career paths. The desired organisational career paths predicted by the I-PIA-M corresponded with the CCI career life themes in all instances. Accordingly, the conclusion is reached that the career construction interview, used jointly with the I-PIA-M, provides clear and rich insights for a better understanding of individuals' current and desired career path predictability and for clarifying tendencies diagnosed during the results analysis of the I-PIA-M.

7.2 CONCLUSIONS RELATING TO THE RESEARCH AIMS

The focus of this section is the formulation of research conclusions regarding the literature review and the empirical study.

7.2.1 Conclusions regarding the literature review

Career anchor preferences, career interests and abilities in the context of P–E fit/individual-organisational career path congruence were discussed in Chapter 3, the aim of which was to provide insight into concepts that have a direct impact on career satisfaction and P–E fit. In the

context of this study, the focus has been on the impact of career interests and self-perceived abilities to obtain an integrated perspective on person–organisation career path congruence, as well as the influence of career anchor preferences to support the notion of individual–organisational career path congruence.

7.2.1.1 Conclusions regarding career anchor preferences

The literature review provided significant research in support of the significance of career anchors in attaining individual–organisational career congruence. Research did indicate though that there may be a need to expand the eight anchors (Schein, 1990) and to investigate the feasibility of including anchors such as creativity in addition to entrepreneurial, as well as to consider the contemporary career milieu in terms anchors such as employability, spiritual purpose and internationalism. In addition, research shown that individuals may display multiple career anchors of differing intensity and the significance of any one anchor may change over time as a result of new experiences and challenges.

7.2.1.2 Conclusions regarding career interests

As stated in Chapter 3, the current research explored various approaches to career or vocational interests, with a particular focus on Holland's (1997) theory of personality and occupational types.

The literature review provided significant research in support of the significance towards individuals seeking out and remaining in a workplace if there is congruence between individual career needs and the degree to which the workplace corresponds with these needs. Workplace environments will recruit, retain and reward people whose career needs are congruent to with the needs of the workplace or organisation. In relation to congruence, all things being equal, individuals seek out, are selected for and remain in occupations that roughly match their level of general ability to the level of complexity required by the work environment (Gottfredson & Holland, 1996). Holland's RIASEC hexagon may be applicable to the South African context and career assessment and counselling based on the model may proceed if valid interest inventories are used (Morgan et al., 2015).

Relevant to Holland's Holland's (1997) theory of personality and occupational types is the theory of TWA/PE-correspondence. All P–E fit theories share the following assumptions: people seek out and create environments that allow them to manifest their traits behaviourally (e.g. dominant individuals seek leadership positions); the extent to which people fit their work environments has

significant consequences (e.g. satisfaction, performance, stress, productivity, turnover), with better fit being associated with better outcomes; and P–E fit is a reciprocal and ongoing process whereby people shape their environments and environments shape people (Rounds & Tracey, 1990; Su et al., 2015. Previous research cited under chapter 3 (focussed on the interactions between the constructs proposed by the TWA/PE correspondence theory and the level of compatibility between individual and environmental attributes to enable person-career path congruence (Dawis & Lofquist, 1993; Dawis, 1996; 2005; Swanson and Schneider, 2013; Van Vianen, 2018). As such, TWA/P-E correspondence requires not only a focus on vocational interests, but also abilities.

7.2.1.3 Conclusions regarding abilities

Research indicated that ability may be defined in terms of various perspectives, including ability as physical or mental capacity, ability as a skill set, and/or ability in the context of occupational activities. For the purposes of the current study, acquired knowledge systems, as defined by the Cattell-Horn-Carroll (CHC) theory of cognitive abilities, will be deemed relevant as a possible influence of the notion of self-perceived abilities. Acquired knowledge systems include comprehension knowledge, domain-specific knowledge, reading and writing, and quantitative knowledge (Schneider & McGrew, 2013). Apart from career interests, skills acquisition plays a critical role in occupational goal attainment (Ostroff et al., 2002), with an emphasis on the fit between an individual's ability, the demand for certain skills and how the individual can acquire these skills (Schreuder and Coetzee, 2016). Ability in the context of occupational activities includes Holland's (1997) hexagon, which forms the core of the WWM in the form of cluster careers (or job groupings) and in relation to the Holland types (RIASEC) (Prediger, 2002). In the context of the WWM (Prediger, 2002, p. 211) and the summary of career clusters and career areas (Prediger, 2002, p. 213), work-relevant abilities include non-cognitive abilities in addition to the usual cognitive abilities, and assume "basic and cross-functional skills" (Prediger, 2002, p. 215). According to Prediger (1999, p. 296), "it appears that measures of work-relevant abilities differ sufficiently from measures of ability self-confidence [self-efficacy beliefs, etc.] for both to be helpful when used in conjunction with measure of interests".

7.2.1.4 Conclusions regarding an integrated framework for measuring career anchor preferences, career interests and abilities

As discussed under chapters 2 and 3, *career path congruence* refers to the alignment between career anchor preferences, career interests, perceived abilities and the organisational expectations represented by world of work career maps

On a theoretical level, the current study sought to enhance understanding of existing career development theories and the gaps in such, as well as the role played by career anchor preferences, career interests and abilities and their application to integrated career path alignment initiatives within the context of the 21st century world of work.

As discussed in Chapter 2, it is important for organisations to understand the concept of career path modelling to promote congruence between the individual and the organisational career path. Career path modelling refers to efforts by organisations to develop career pathways based on educational, industry and organisation-specific career path frameworks. Accordingly, career maps are used to show what a prototypical career looks like in terms of sequential positions, roles and stages (Cao & Thomas, 2013). Such maps display common avenues for moving within and across jobs in ways that facilitate growth and career advancement. Career maps (Cao & Thomas, 2013) are typically displayed in a diagram, making it easy to visualise each position or role as a stage along a path. Career mapping should benefit practices aimed at assisting individuals to identify positions within the organisation that best meet their career anchor preferences, career interests and abilities.

In investigating the theoretical relationship between an individual's career anchor preferences, career interests and abilities and the way in which these constructs relate to organisational career path frameworks, as well as for promoting employability, an understanding of the notion of P–E fit is important. Research has shown that career path models are based on educational or academic principles (CESM, 2014; Department of Education of Minnesota, 2007; DHET, 2013; Visser, 2015), which in turn are based on established research models such as Holland's (1997) RIASEC framework (O*NET Centre, 2007; WWM, Prediger, 2002) and occupational or job clustering perspectives such as the OFO (DHET, 2013) and ISCO-88 (International Labour Organisation, 2012). All these models consider career interests, abilities and organisational job requirements (including competencies) as being critical for job success and job satisfaction.

7.2.2 Conclusions regarding the empirical study

The empirical study was designed to answer six research questions, which were restated in the form of research hypotheses (quantitative study) and propositions (qualitative study). The research aims of the empirical study were as follows:

- To empirically operationalise the constructs of preferences, career interests and abilities into an integrated empirical measurement scale (I-PIA-M) to guide individual–organisational career path congruence in the South African organisational context.
- To assess whether age, gender and career life stage significantly and positively predict individuals' career anchor preferences, career interests and abilities profile.
- To explore whether individuals from various race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities.
- To apply the empirically validated integrated career anchor preferences, career interests and abilities congruence scale (I-PIA-M) in practice to explore individual–organisational career path congruence.

7.2.2.1 The first empirical aim: To empirically operationalise the constructs of preferences, career interests and abilities into an integrated empirical measurement scale (I-PIA-M) to guide individual–organisational career path congruence in the South African organisational context.

Conclusion 1: Individuals' career anchor preferences, career interests and abilities fit into a holistic multi-dimensional framework that can be assessed in a reliable and valid manner.

Conclusion 2: The career anchor preferences as measured by the Schein's (2006) COI are a valid subscale of the I-PIA-M, specifically general managerial, autonomy/independence, entrepreneurial creativity, service/dedication to a cause, pure challenge, and lifestyle.

Conclusion 3: The notion of assessing individuals' career anchor preferences, career interests and abilities in an integrated manner can be achieved by means of the I-PIA-M as a valid and reliable measure of complementary forms of P-E fit.

7.2.2.2 The second empirical aim: To assess whether age, race, and gender significantly and positively predict individuals' career anchor preferences, career interests and abilities profile

Conclusion 1: Race and gender significantly explain individuals' self-perceived career anchor preferences and career interests but not their self-perceived abilities. In terms of career path congruence, the conclusion can be reached that race and gender have strong differentiating influence on career path selection, whilst self-perceived abilities are individual-specific and not influenced by race and gender.

Conclusion 2: Within the parameters of this research age does not significantly explain individuals' self-perceived career anchor preferences, career interests and abilities. In terms of career path congruence, and within the parameters of this research, age does not represent a differentiating factor in career path congruence. In terms of age, a limitation of this study is that age group ranges applied in statistical analysis during this research, 40+ years = 4.41; M ≤ 40 years, could have influenced the outcome in terms of this conclusion. A more even distribution of participants in terms of Super (1990) life stage theory could have resulted in a different conclusion. As a result, it is recommended that age remains a factor in career path congruence pending further research proving otherwise.

7.2.2.3 The third empirical aim: *To explore whether individuals from various race, gender and age groups differ significantly regarding their career anchor preferences, career interests and abilities.*

Conclusion 1: Individuals from various race, gender and age groups differ significantly regarding their career interests. Black participants scored significantly higher than their white counterparts on several variables. Male and female participants differed significantly on all the career interests, with male participants scoring significantly higher than their female counterparts on several variables.

From a career path congruence perspective, blacks reported a stronger alignment in terms of the interests measured through the I-PIA-M than their white counterparts who participated in this study, whilst men reported a stronger alignment than their female counterparts who participated in this research. Further research needs to be conducted to investigate the significance of alignment to career interests not measured through the I-PIA-M. Within the parameters of this

research age did not significantly explain individuals' career interests and career anchor preferences. A limitation of this study is that age group ranges applied in statistical analysis during this research, 40+ years = 4.41; M ≤ 40 years, could have influenced the outcome in terms of this conclusion. A more even distribution of respondents in terms of Super (1990) life stage theory could have resulted in a different conclusion. As a result, it is recommended that age remains a factor towards measuring career interests in career path congruence pending further research proving otherwise.

Conclusion 2: Individuals from various race, gender and age groups differ significantly regarding their abilities. Black participants scoring slightly higher than their white counterparts on several variables. Male and female participants differed slightly on all the abilities, with male participants scoring slightly higher than their female counterparts on several abilities.

Participants from the ≤ 40 years and 40+ years age groups differed slightly on the abstract reasoning ability. A limitation of this study is that age group ranges applied in statistical analysis during this research, 40+ years = 4.41; M ≤ 40 years, could have influenced the outcome in terms of this conclusion. A more even distribution of respondents in terms of Super (1990) life stage theory could have resulted in a different conclusion. As a result, it is recommended that age remains a factor towards measuring career abilities in career path congruence pending further research proving otherwise.

Conclusion 3: Individuals from various race, gender and age groups differ significantly regarding their career anchor preferences. Black participants scored significantly higher than their white counterparts on several variables. Male and female participants differed significantly on all the career anchor preferences, with male participants scoring significantly higher than their female counterparts on several career anchor preferences. Participants from the 40+ group scored slightly lower than the ≤ 40-year age group on the autonomy/independence career anchor preference. From a career path congruence perspective, blacks reported a stronger alignment in terms of the career anchor preferences measured through the COI as part of the I-PIA-M than their white counterparts who participated in this study, whilst men reported a slightly stronger alignment than their female counterparts who participated in this research. Within the parameters of this research age does not significantly explain individuals' career anchor preferences. A limitation of this study is that age group ranges applied in statistical analysis during this research, 40+ years = 4.41; M ≤ 40 years, could have influenced the outcome in terms of this conclusion. A more even distribution of participants in terms of Super (1990) life stage theory could have

resulted in a different conclusion. As a result, it is recommended that age remains a factor towards measuring career anchor preferences in career path congruence pending further research proving otherwise.

7.2.2.4 The fourth empirical aim: *To apply the empirically validated integrated career preferences, career interests and abilities congruence scale (I-PIA-M) in practice to assess individual–organisational career path congruence.*

Conclusion 1: Individuals attach various meanings to their perceptions of their career interests which manifest as core themes influencing person–organisational career path congruence, with the results indicating multidirectional career path interests. In terms of career path congruence, the results of the I-PIA-M predict a strong tendency towards individuals considering multiple career pathways relevant to their respective career interests towards more than one career field. This should allow organisations the opportunity to be more flexible in terms of career path modelling to best align and individual's profile to multiple career path opportunities from a person-organisation career path congruence perspective.

Conclusion 2: Individuals attach various meanings to their perceptions of their self-perceived abilities which manifest as core themes influencing person–organisational career path congruence, with the results supporting multidirectional career path interests. In terms of career path congruence, the results of the I-PIA-M predict a strong tendency towards individuals considering multiple career pathways relevant to their respective abilities towards more than one career path. This should allow organisations the opportunity to be more flexible in terms of career path modelling to best align and individual's profile to multiple career path opportunities from a person-organisation career path congruence perspective.

Conclusion 3: Individuals attach various meanings to their perceptions of their career anchor preferences which manifest as core themes influencing person–organisational career path congruence, with the results supporting multidirectional career paths. In terms of career path congruence, the results of the I-PIA-M predict a strong tendency towards individuals considering multiple career pathways relevant to their respective career anchor preferences profile towards more than one career path. This should allow organisations the opportunity to be more flexible in terms of career path modelling to best align and individual's profile to multiple career path opportunities from a person-organisation career path congruence perspective.

Conclusion 4: Individuals report congruence between their self-perceived career interests, abilities and career anchor preferences which manifest as core themes influencing person–organisational career path congruence. The results support multidirectional desired career path prediction as reported by the career interests, abilities and career anchor preferences profile of the I-PIA-M. In terms of career path congruence, the results of the I-PIA-M predict a strong tendency towards an integrated alignment between the various factors (career anchor preferences, career interests, abilities) and clear future career pathways. This should allow organisations the opportunity to be more flexible in terms of alignment of an individual's integrated career path profile and multiple career path opportunities within organisations from a person environment correspondence and person-organisation career path congruence perspective.

Conclusion 5: Individuals report congruence between their self-perceived career interests, abilities and career preferences, and the career-life themes elicited from the career construction interview which manifested as core themes influencing person–organisational career path congruence. The conclusion is reached that the career construction interview provides a better understanding of an individual's current and desired career path predictability and assists in clarifying tendencies diagnosed during the results analysis of the I-PIA-M. In terms of career path congruence, the application of a self-report questionnaire (such as the I-PIA-M) together with the career construction interview techniques promotes a clear understanding of an individual's career life themes based on his/her life portrait, whilst the questionnaire (such as the I-PIA-M) represents a more in depth understanding of the individual's predicted career path profile. This research shown the value of integrating a self-reporting quantitative and structured career discussion from a career life theme perspective. Due to the fact that the career construction interview is not based on the results of the quantitative questionnaires (such as the I-PIA-M including the career orientations inventory) but representative of an independent career discussion of which the outcomes is integrated with the questionnaire (such as I-PIA-M) results increases the meaningfulness, validity and reliability of the overall career path predictability.

7.2.3   Conclusions regarding the central hypothesis

The central hypothesis of the study states that an integrated measure of individuals' career anchor preferences, career interests and abilities can be developed in alignment with P–E fit theories to measure career path congruence in the contemporary work environment. Based on the findings of the current study, the central hypothesis is hereby accepted.

7.3 IMPLICATIONS AND RECOMMENDATIONS FOR CAREER DEVELOPMENT GUIDANCE PRACTICE

Based on the research findings, conclusions and limitations, the following recommendations for career psychology and further research in the field are outlined:

7.3.1 Recommendations for the field of career psychology

Based on the significant relationships and the findings that were revealed, the interventions described below in terms of person–organisational career path congruence are recommended. These recommendations are made to promote effective career guidance and counselling services as well as career satisfaction in the contemporary world of work environment.

7.3.1.1 Person–career path congruence

- A focus on understanding an individual's career anchor preferences, career interests and abilities profile will assist in matching the individual's integrated profile to desired career paths.
- Deeper insight should be created in individuals to understand their career path alternatives based on multidirectional career anchor preferences, career interests and abilities from an integrative perspective, as well as to explore the most suitable desired career paths and better understand dissatisfaction with current career paths.
- Qualitative insights should be created by the additional application of the career construction interview to further explore and/or improve alignment of career life themes, as well as to clarify and/or confirm career paths explored during the application of the I-PIA-M.
- Integrated career path patterns should be developed through the assessment of career anchor preferences, career interests and abilities using the I-PIA-M. Individuals who understand the patterns of their integrated I-PIA-M profile, complemented by the career themes identified during the career construction interview, are more likely to be satisfied with their careers, especially if they are aligned to their profile.
- Individual career guidance interventions: In seeking alignment between considerations related to individuals' integrated profile and academic and world of work career paths, individuals should be assisted to have a better understanding of the various career path models and how these relate to their own profile and the world of work.

- Career search interventions: Better aligned career self-search techniques should be promoted based on a greater understanding of own career path preferences and the various career models that guide person–career path congruence.

7.3.1.2 Career path congruence in the organisational context

- Organisational career guidance practice should be designed to promote person–organisational career path congruence.
- The organisational job structure should be aligned to theoretical, industry and educational career path considerations to promote a clear basis for person–organisation career path congruence and to promote an effective career management programme throughout the organisation.
- Career management programmes (including career workshops and access to career path information) should be introduced into organisations to create avenues for employees to align their own integrated profiles with the career paths and maps available in within industry and the organisation in particular and the industry in general.
- Career management principles should be integrated into organisations' talent management practices.

7.4 LIMITATIONS

This section critically evaluates the limitations of the research.

7.4.1   Limitations of the literature review

Research on the link between P–E fit and career anchor preferences, career interests and abilities tend to be somewhat nebulous. Although career interests and abilities have been covered to a certain extent as a result of occupational models based on Holland's (1997) theory, no clear link has been found to career anchor preferences.

Although much research confirms the importance of linking individual career anchor preferences, career interests and ability profiles to occupational frameworks, limited research exists in relation to the organisational (actual work) environment. The only references (excluding career anchor preferences) involve the O*NET and OFO and ISCO frameworks. In South Africa, little or no evidence has been found for a link between career anchor preferences, career interests and

ability profiles and the OFO, although a link between the OFO and ISCO has been established. The conclusion can therefore be reached that in the case of the ISCO and the OFO, the focus is work centric and does not necessarily consider person-centric profiles when attempting to achieve P–E career congruence.

One of the main limitations of this study is that it focused on three elements of individual–organisational career path congruence only, namely, career anchor preferences, career interests and self-perceived abilities, with various other factors impacting on person-career path congruence. Recommendations for future research is provided under section 7.5.1.

7.4.2   Limitations of the empirical study

The sample (N = 270) for the quantitative part of the study mainly included participants in the 26 to 40 and the under 25 age groups, with only 39 participants falling into the 41 to 55 age group. The inclusion of more participants from the 41 to 55 age group could have enhanced the results for this group. Although the research comprised a mixed-method approach, including a quantitative (N = 270) and a qualitative (N = 5) study, as well as a case study on one of the respondents who participated in the qualitative study, a larger and more representative sample of the different groups in both the quantitative and the qualitative studies could have assisted in making more meaningful cross-cultural comparisons.

In terms of demographic information, detailed information pertaining to study fields was not obtained. Such information could have enhanced integration with educational model frameworks.

Although general levels of career satisfaction and general levels of job satisfaction were established, no detailed data was collected and analysed – this may have provided insight into participants' career experience.

In completing the I-PIA-M the process may have been richer had the Self Directed Search (SDS) (Holland, 1972) or Interest Determination, Exploration and Assessment System (IDEAS) (Johansson, 2007) questionnaire also been completed for verification and/or confirmation purposes by all participants in both the quantitative and the qualitative study. In addition, in a case study which formed part of the qualitative study, one participant was asked to complete the IDEAS questionnaire in order to verify it against the RIASEC profile derived from the I-PIA-M results. Subsequently, adequate correlation was reported but no generalisation statement could be formulated.

7.5 RECOMMENDATIONS FOR FUTURE RESEARCH

This section provides recommendations for future research.

7.5.1   Future research: literature considerations

The researcher acknowledges that factors such as emotional intelligence, workplace performance, job and career satisfaction, as well as socioeconomic factors and personal circumstances, including job scarcity and career calling, require further investigation in pursuit of person–organisational career path congruence.

Integrated frameworks (P–E) are still vague and much is left to the interpretation of the counsellor (no clear integration framework apart from Holland's theory which gives an indication of alignment to WWM/O*NET). Consequently, what is still lacking is research that indicates that organisations (actual world of work) align to, for example, O*NET and WWM, with educational models seemingly doing so to a greater extent.

Previous research has indicated that career anchor preferences may require a revisit as there may be a need for additional anchors to accommodate the contemporary world of work.

7.5.2   Future research: Empirical considerations

As stated under section 7.4.2, a larger and more representative sample of the different groups in both the quantitative and the qualitative studies could have assisted in making more meaningful cross-cultural comparisons. Future research should explore the psychometric properties of the I-PIA-M in larger and more varied samples in various occupational contexts.

To strengthen the relevance of this study in the context of educational career frameworks, detailed information pertaining to study fields (although the latter was not the focus of this study) could enhance a better understanding of the impact of educational fields of study on person-career path congruence.

The study was cross-sectional in nature and longitudinal study designs are recommended to assess whether people's career anchor preferences, career interests and self-perceived abilities change along with changing organisational or world of work contexts such as the fast emerging digital era and technological-driven occupations.

The I-PIA-M appears to be free of bias. However, further studies (e.g. structural equivalence) with larger samples are required to assess whether the I-PIA-M is equitable for use across age, gender and race groups in the South African context. Future research studies should explore the structural equivalence of the I-PIA-M for various age, gender and race groups in different occupational settings.

In the light of the psychometric soundness of the I-PIA-M, researchers could potentially replicate the study by assessing the impact of individuals' career anchor preferences, career interests and self-perceived abilities on organisational career pathways in other research settings. Such replication studies could assist in further refining the I-PIA-M since not all career fields and organisational career pathways were covered by this study.

Cross-validation studies are also needed to assess the predictive (criterion-related) validity and discriminant validity of the I-PIA-M in relation to similar measures of person–organisational career path congruence, and to explore the alignment between individual and organisational career path requirements in different workplace settings.

Longitudinal studies are also recommended to assess the development of organisational career path frameworks and align them to educational, industry or discipline-related world of work maps over time in light of the multi-directional career path congruence that evolves over the lifespan.

The items included in the I-PIA-M are by no means exhaustive. Future studies could engage in further interrogation and application of the I-PIA-M which may result in the addition and/or removal of items and subscales in ways that may enhance the measure's reliability and validity.

It is recommended that future research in different occupational settings with a broader representation of age, gender and race groups, and organisational career path alignment and/or design further investigate the structural equivalence of the I-PIA-M to further explore its value for career fields not measured during this study.

7.6 EVALUATION OF THE STUDY

This section will reflect on the value added by the study at a theoretical, empirical and practical level, and in addition, the value added to my graduateness as a doctoral candidate.

7.6.1 Value added at a theoretical level

The literature review explored a comprehensive range of person–organisation career path congruence constructs (i.e. career anchor preferences, career interests and self-perceived abilities) and critically evaluated their relevance to organisational career path congruence in the contemporary workplace. Furthermore, these constructs were evaluated from a career psychology and multidimensional P-E fit theory perspective by differentiating between the underlying substructures and/or subdimensions to explore the impact of these on person–organisation career path congruence. The findings of the literature review were supported by this study, which confirmed the important role of career anchor preferences, career interests and self-perceived abilities in guiding person–organisation career path congruence. Similarly, the study confirmed alignment of career interest fields and abilities considered in this research to the educational and world of work career maps explored during this research.

The research confirms the importance of multidirectional career path considerations as individuals' integrated career anchor preferences, career interests and abilities profile may relate to more than one organisational career path, allowing flexibility in terms of person–organisational career path congruence. In this regard, the study broke new ground and added novel insights into person–organisation career path congruence and how the interrelationship between individual career anchor preferences, career interests, and abilities can be measured in a reliable and valid manner in the context of educational and world of work career maps or pathways to promote person-organisation career path congruence. The study added to the existing research literature on the effect of career anchor references, career interests and self-perceived abilities when predicting current and desired person–organisational career path congruence in the context the of career psychology.

7.6.2 Value added at an empirical level

At an empirical level, the study broke new ground by studying person–organisation career path congruence from a multidimensional and career psychology perspective in the multiculturally diverse South African work context.

The empirical study showed that the factors involved in some of the constructs had to be re-aligned in terms of questionnaire items, which resulted in the integration of constructs per factor. However, based on the EFA, they remained linked to the constructs and subconstructs identified

during the theoretical research. The study, especially the qualitative study, clearly showed on face validity, a direct alignment between an individual's career anchor preferences, career interests and self-perceived abilities and their current and desired person–organisation career path.

The study confirms the theoretical and empirical belief that career development is multidirectional in nature and can be measured in a reliable and valid manner in the South African multiculturally diverse work context using an integrated measure of career anchor preferences, career interests and abilities. Despite the limitations mentioned, it may be concluded that the study indicates that the I-PIA-M can be applied to the various population groups in the South African context. However, future research studies should explore the structural equivalence of the I-PIA-M for various age, gender and race groups. In addition, it was found that the career construction interview has the benefit of complementing the instrument. These findings are promising for the future validation and standardisation of the I-PIA-M.

Overall, the construction of the I-PIA-M constitutes a potentially important advancement in career psychology and P-E fit theory and research with a focus on enhanced understanding of the integrated nature of individuals' career anchor preferences, career interests and abilities profile and how it relates to the world of work. This may hopefully stimulate empirical research and theory development in integrated career management and career psychology in today's changing organisational and employment environment. Future cross-validation studies are bound to lead to a deeper understanding of the construct of career path congruence and its underpinning subdimensions and may shed light on the conditions and contexts in which the application of the I-PIA-M or a similar measure of integrated career anchor preferences, career interests and abilities is most useful.

7.6.3   Value added on a practical level

On a practical level, the I-PIA-M contributes to the fields of career psychology and industrial and organisational psychology in terms of providing a better understanding of the impact of career anchor preferences, career interests and self-perceived abilities, as career psychology constructs, on person–organisation career path congruence. As a valid theoretical framework and measure, the I-PIA-M dimensions provide useful information on measuring individuals' career path profiles in an integrated and holistic manner by focusing on a broad spectrum of positive career psychological constructs relevant to P-E fit in terms of career anchor preferences, career interests and self-perceived abilities. The I-PIA-M applies principles of person-vocation

congruence, person-job congruence and person-organisation congruence in a holistic manner. This may prove to be useful in career interventions focused on guiding career path congruence.

The results of the qualitative study reported an enrichment in terms of the understanding of person–organisation career path congruence through the application of the career construction interview technique in addition to the I-PIA-M. In explaining the level of congruence for current and desired career paths, the results of the I-PIA-M support the outcomes of the career construction interview in terms of the alignment between an individual's career life themes derived from the interview, and integrated career anchor preferences, career interests and self-perceived abilities profile measured through the I-PIA-M.

The outcomes of the career construction interview clarified and confirmed the tendencies identified during the I-PIA-M through value-add content to provide greater insight into person–organisation career path congruence. Applying the I-PIA-M together with the career construction interview provides a foundation on which workplace career guidance counsellors can align the outcomes to organisational career pathways. It also aims to provide insight in terms of the factors involved in person–organisation career path congruence to assist with the alignment of organisational career paths with the various models of career path congruence explored during this research to enhance the level of alignment between individual and organisational career paths through career path modelling. Practitioners, through applying the I-PIA-M and career construction interview, should be able to further explore the level of person-career path congruence in the context of their own workplace environments and to further explore the feasibility of the I-PIA-M in terms of career fields not included in this research.

The research found that P–E fit (theory of career path congruence) is important for contemporary career counselling. It is therefore important for career counsellors to consider career anchor preferences, career interests and abilities as an integrated framework and aligned to organisational/occupational frameworks.

Individual career anchor preferences, career interests and ability profiles cannot be viewed in isolation from organisational/occupational competency requirements.

In conclusion, the researcher anticipates that the research findings will provide a better understanding of person–organisation career path congruence through the measurement of the I-PIA-M in conjunction with the career construction interview. It is hoped that organisational

psychologists, career and human resource professionals, and managers will be able to apply the new knowledge of person–organisation career path congruence effectively in the organisational context. The research findings, conclusions and recommendations should make a positive contribution to the field of industrial and organisational psychology, and in particular to the field of career psychology, in the South African context.

7.6.4　Value added to my graduateness as a doctoral candidate

On personal level, my experience and growth as a student can be categorised in terms of academic learning, subject-related insights, and personal growth and development. From an *academic learning perspective*, and being a workplace practitioner, great value was gained in translating literature and practice into an academic thinking framework. Such a framework requires discipline relevant to research, content, and ethical and technical requirements. Conducting the study emphasised the importance of basing a professional practice on sound and detailed theoretical frameworks, to analyse these critically, substantiate conclusions and findings in order to promote the credibility, reliability and validity of the research findings, conclusions and limitations. The research, and the documenting thereof, provided an opportunity to enhance knowledge and broaden perspectives on the constructs of career anchor preferences, career interests and abilities as factors that contribute to career psychology from a person–organisation career path congruence perspective.

The study provided an opportunity to gain *subject-related insights* into the interrelationships and correlations between an individual's integrated career anchor preferences, career interests and abilities profile and educational, industry and theory-based career path models. It provided new insights into career psychology in the contemporary world of work, the way career modelling and career maps should be considered essential in career management practice in organisations and the way the individual's integrated career anchor references, career interests and abilities profile relates to desired career paths to promote a better P–E (person–organisation career path) fit. The study also created a platform for understanding the shortcomings in the organisational context in terms of creating an environment for person–organisation career path alignment and it is hoped that the study will add value to the field of career psychology to promote person–organisation career path congruence.

In the context of *personal growth and development*, I believe that the study enhanced my own capabilities for providing individuals and organisations with meaningful career guidance and

counselling to promote person–organisation career path congruence. It was also realised that the mix of quantitative and qualitative measures and techniques such as the career construction interview should not be underestimated. The study led to the conclusion that as a career guidance and counselling professional I should strive to attain a better understanding of holistic approaches during service delivery and develop my own level of competence through continued lifelong learning.

7.7 CHAPTER SUMMARY

This chapter discussed the conclusions and limitations of the study and made recommendations for both practice and future research. The possible limitations of the study were discussed with regard to both the theoretical and the empirical study. Recommendations for future research were highlighted. Finally, an overview of the research was given. The fact that the degree to which the results proved to support person–organisation career path congruence can be measured in a reliable and valid manner was highlighted, as well as the manner in which this research contributed to the development of the I-PIA-M.

In this chapter, the following research aim was attained:

Research aim 5: To formulate conclusions, limitations and recommendations on person–organisation career path congruence, career psychology-related practices and future research.

This concludes the research project.

REFERENCES

Abbott, M. L., & McKinney, J. (2013). *Understanding and applying research design*. Hoboken, NJ: Wiley.

Ackerman, P. L., & Heggestad, E. D. (1997). Intelligence, personality and interests: Evidence for overlapping traits. *Psychological Bulletin,* 121, 219–245.

ACT. (2009). *Interest Inventory technical manual*. Iowa City, IA: ACT.

Adam, F. (2014). *Measuring National Innovation Performance.* SpringerBriefs in Economics. Retrieved from doi:10.1007/978-3-642-39464-5_2.

Akkermans, J. & Kubasch, S. (2017). Trending topics in careers: a review and future research agenda. *Career Development International, 22*(6*)*, 586–627.

Alqahtani, M., & Mohammad, H. (2015). Mobile applications' impact on student performance and satisfaction. *Turkish Online Journal of Educational Technology,* 14(4), 102-112.

Almalki, S. (2016). Integrating quantitative and qualitative data in mixed methods research—challenges and benefits. *Journal of Education and Learning*, 5, 288-296.

Amundson, N. E., Harris-Bowlsbey, J., & Niles, S. G. (2009). *Essential elements of career counseling: Processes and techniques* (2nd ed.). Upper Saddle River, NJ: Pearson Education.

Anthoney, S. F., & Armstrong, P. I. (2010). Individuals and environments: linking ability and skill ratings with interests. *Journal of Counseling Psychology,* 57(1), 36–51.

Armstrong, P. I., Day, S. X., McVay, J. P., & Rounds, J. (2008). Holland's RIASEC Model as an Integrative Framework for Individual Differences. *Journal of Counseling Psychology,* 55(1), 1–18.

Arnold, J., & Randall, R. (2010). *Work psychology: Understanding human behaviour in the workplace* (5th ed.). Harlow, Essex: Pearson Education.

Arthur, M. B., & Rousseau, D. M. (1996). *The boundaryless career: A new employment principle for a new organizational era*. New York: Oxford University Press.

Arulmani, G., Bakshi, A. J., Leong, F. T. L., & Watts, A. G. (2014). The manifestation of career: introduction and overview. In G. Arulmani et al. (Eds), *Handbook of career development, International perspectives.* New York, NY: Springer.

Arnold, J. (2004). The congruence problem in John Holland's theory of vocational decisions. *Journal of Occupational and Organizational Psychology*, 77 (1), 95-113.

Ashraf, G., Kadir, S. A., Pihie, Z. A. L., & Rashid, A. M. (2014). The mediator role of organizational innovativeness between organizational culture and organizational effectiveness. *British Journal of Education, 2*(6), 30–54.

Athanasou, J. A. (2011, Autumn). Advantages and disadvantages of the different inventoried approaches to assessing career interests. *Australian Journal of Career Development, 20*(1), 53–62.

Atli, A. (2016). The effects of trait-factor theory based career counseling sessions on the levels of career maturity and indecision of high school students. *Universal Journal of Educational Research,* 4(8), 1837–1847.

Axinte, R., & Şoitu, L. (2013). *Constructivist approaches to career counseling.* International conference of scientific paper AFASES 2013, Brasov.

Aydogmus, C. (2018). Millennials' career attitudes: The roles of career anchors and psychological empowerment. *International Journal of Academic Research in Business and Social Sciences*, 8(6), 1–23.

Baglama, B. & Uzunboylu, H. (2017). The relationship between career decision-making self-efficacy and vocational outcome expectations of preservice special education teachers. *South African Journal of Education*, 37(4), 1-11.

Baily, C & Madden, A. (2016, Summer). *What makes work meaningful – or meaningless. MT Sloan Management Review.*, 57(4), 53-61.

Baker, G. A., Bromley, R. L., Briggs, M., Cheyne, C. P., Cohen, M. J., García-Fiñana, M., & Meador, K. J. (2015). IQ at 6 years after in utero exposure to antiepileptic drugs: A controlled cohort study. *Neurology,* 84(4), 382–390.

Barclay, W. B., Chapman, J. R., & Brown, B. (2013). The underlying factor structure of Schein's career anchor model. *Journal of Career Assessment,* 21, 430–451.

Barclay, S.R. (2012). *Hammers, nails, and other tools: collaborating with students in constructing a career.* SACSA Annual Conference: Memphis, TN.

Barkhuizen, H., Jorgensen, L. I., & Brink, L. (2014) Exploring the role of the industrial-organisational psychologist as counsellor. *SA Journal of Industrial Psychology/ SA Tydskrif vir Bedryfsielkunde*, 40(1). Retrieved from http://dx.doi.org/10.4102/sajip.v40i1.1193

Bartlett, M. S. (1954). A note on the multiplying factors for various χ 2 approximations. *Journal of the Royal Statistical Society. Series B (Methodological)*, 1, 296–298.

Barley, S. R. & Bechky, B. A. (2017). The changing nature of work: Careers, identities, and work lives in the 21st century. *Academy of Management Discoveries*, 3(2), 111–115.

Baruch, Y. (2004). Transforming careers: From linear to multidirectional career paths – organizational and individual perspectives. *Career Development International,* 9*,* 58–73.

Baruch, Y. (2006). Career development in organizations and beyond: balancing traditional and contemporary viewpoints. *Human Resource Management Review*, 16 (2), 125-138.

Baruch, Y., & Vardi, Y. (2016). A fresh look at the dark side of contemporary careers: Towards a realistic discourse. *British Journal of Management,* 27, 355–372.

Beer, S. (1989). *The Viable System Model: Its provenance, development, methodology and pathology*. New York: John Wiley & Sons.

Bellini, T. (2015). The forward search interactive outlier detection in cointegrated VAR analysis. *Advances in Data Analysis and Classification*, 1, 1–23.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin,* 88(3), 588.

Bergh, Z.C. (2009). *Psychometric properties of the Subjective Work Experiences Scale*. Unpublished research report, and Organisational Psychology, University of South Africa, Pretoria, South Africa.

Bernard, H. R. (2002). *Research methods in anthropology: Qualitative and quantitative approaches* (3rd ed.). Walnut Creek, CA: Altamira Press.

Bertanha, M., & Moser, P. (2016). Spatial errors in count data regressions. *Journal of Econometric Methods,* 5(1), 49–69.

Betz, N. E. (2008). Advances in vocational theories. In S. D. Brown & R. W. Lent (Eds.), *Handbook of counseling psychology* (4th ed.; pp. 357–374). Hoboken, NJ: Wiley.

Betz, N. E., Fitzgerald, L. F., & Hill, R. E. (1989). Trait-factor theories: Traditional cornerstone of career theory. In M. B. Arthur, D. T. Hall, & B. S. Lawrence, (Eds*.), Handbook of career theory* (26-40). Cambridge, UK: Cambridge University Press.

Bezuidenhout, M., Grobler, A., & Rudolph, E. C. (2013). The utilisation of a career conversation framework based on Schein's career anchors model. *SA Journal of Human Resource Management;* 11(1), Art. #491, 10 pages]. Retrieved from doi:org/10.4102/sajhrm.v11i1.491.

Billeh, N. (2016). *The career development challenge: How to adopt successful career mapping strategies.* The FAHR International Conference. Retrieved from https://www.fahr.gov.ae/Portal/Userfiles/Assets/Documents/a3296525.pdf.

Bloomberg, L. D., & Volpe, M. (2008). *Completing your qualitative dissertation: A roadmap from beginning to end*. Thousand Oaks, CA: Sage.

Bloor, M. (2001). Techniques of validation in qualitative research: A critical commentary. In R. M. Emerson (Ed.), *Contemporary field research* (pp. 383–396). Prospect Heights, IL: Waveland Press.

Bravo, J., Seibert, S. E., Kraimer, M. L., Wayne S. J., & Liden, R. C. (2017). Measuring career orientations in the era of the boundaryless career. *Journal of Career Assessment*, 25(3) 502–525.

Briscoe, J., & Hall, D. (2006). The interplay of boundaryless and protean careers: Combinations and implications. *Journal of Vocational Behavior*, 69(1), 4–18.

Briscoe, J. P., Hall, D. T., & DeMuth, R. L. F. (2006). Protean and boundaryless careers: an empirical exploration, *Journal of Vocational Behavior,* 69(1), 30–47. Retrieved from doi:10.1016/j.jvb.2005.09.003.

Bryman, Alan. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research* (6), 97–113.

Bubany, S. T., & Hansen, J. C. (2010). Ability self-estimates and self-efficacy: Meaningfully distinct? *Measurement and Evaluation in Counseling and Development,* 43(3), 168–187.

Bullock, E. E., Braud, J., Andrews, L., & Phillips, J. (2009). Career concerns of unemployed U.S. war veterans: Suggestions from a cognitive information processing approach. *Journal of Employment Counseling*, 46, 171–181.

Bullock-Yowell, E., McConnell, A. E., & Schedin, E. A. (2014). Decided and undecided students: Career self-efficacy, negative thinking, and decision-making difficulties, *NACADA Journal*, 34(1), 22-34.

Burns, S. T. (2014, June). Validity of person matching in vocational interest inventories. *The Career Development Quarterly,* 62, 114–127.

Burrus, J., Jackson, T., Xi, N., & Steinberg, J. (2013, November). *Identifying the most important 21st century workforce competencies: An analysis of the Occupational Information Network (O*NET).* ETS Research Report Series.

Button, P. (2016). Model uncertainty and model averaging in regression discontinuity designs. *Journal of Econometric Methods,* 5(1), 103–116.

Cable DM, DeRue DS. (2002). The convergent and discriminant validity of subjective fit perceptions. *Journal of Applied Psychology*, 87, 875–884.

Callanan, G. A., Perri, D. F. & Tomkowicz, S. M. (2017). Career management in uncertain times: Challenges and opportunities. *The Career Development Quarterly*, 65, 353–365.

Campbell, D. (2002, May). The history and development of the Campbell Interest and Skill Survey. *Journal of Career Assessment,* 10(2), 150–168.

Campbell, D. P. (1977). *Manual for the Strong-Campbell Interest Inventory* (2nd ed.). Stanford, CA.: Stanford University Press.

Cao, J., & Thomas, D. (2013). W*hen developing a career path, what are the key elements to include?* Retrieved from http://digitalcommons.ilr.cornell.edu/student/43/.

Caplan, R. D. (1987). Person–environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior,* 31, 248–267.

Careers.co.za. (2006). *Jobfile South Africa: the essential careers handbook*. Pretoria: Careers.co.za.

Cascio, W. F., & Aguinis, H. (2011). *Applied psychology in human resource management* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Carless, S. A. (1999). Career assessment: Holland's vocational interests, personality characteristics, and abilities. *Journal of Career Assessment,* 7(2), 125–144.

Cascio, W. F., & Aguinis, H. (2011). *Applied psychology in human resource management* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

CESM. (2014). *Classification of Educational Subject Matter (CESM).* Pretoria: Department of Higher Education and Training*.*

Cewińska, J., Grzesiak, L., Kusideł, E. & Kabalski, P. (2017). Holland's personality types versus preferences in accounting. *Zeszyty Teoretyczne Rachunkowości,* 93(149), 23–59.

Chai, T., & Draxler, R. R. (2014). Root mean square error (RMSE) or mean absolute error (MAE)? Arguments against avoiding RMSE in the literature. *Geoscientific Model Development*, 7(3), 1247–1250. Retrieved from doi:10.5194/gmd-7-1247-2014.

Chuang, S. (2013, Spring). Essential skills for leadership effectiveness in diverse workplace development. *Online Journal for Workforce Education and Development,* 6(1), Retrieved from https://opensiuc.lib.siu.edu/ojwed/vol6/iss1/.

Church, A. H., & Waclawski, J. (2010). Take the Pepsi challenge: Talent development at PepsiCo. In R. Silzer, & B. E. Dowell B.E. (Eds.), *Strategy-driven talent management: A leadership imperative* (pp. 617–640). San Francisco, CA: Jossey-Bass.

Churchill, G.A. & Peter, J.P. (1984). Research design effects on the reliability of rating scales: A meta-analysis. *Journal of Marketing Research*, 21(4), 360–375.

Clark, L. E., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7(3*), 309–319.

Clissett, P. (2008). Evaluating Qualitative Research. *Journal of Orthopedic Nursing*, 12, 99-105.

Coetzee, M., Botha, J., Kiley, J., Truman, K., & Tshilongamulenzhe, M. C. (Eds.). Eds. *Practising Training and Development in South African Organisations*. Cape Town: Juta.

Coetzee, M., & Gunz, H. 2012. Careers and retention of staff in the 21st century world of work: Introduction to the special edition. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur,* 10(2). Retrieved from http://dx.doi.org/10.4102/sajhrm.v10i2.505.

Coetzee, M., & Roythorne-Jacobs, H. L. (2012). *Career counselling and guidance in the workplace: A manual for career practitioners*. Cape Town: Juta.

Coetzee, M., & Schreuder, A. M. G. (2008). A multicultural investigation of students' career anchors at a South African higher education institution. *South African Journal of Labour Relations,* 32(2), 45–65.

Coetzee, M., & Schreuder, A. M. G. (2010). *Personnel psychology: An applied perspective*. Cape Town: Oxford University Press.

Coetzee, M., & Schreuder, A. M. G. (2014). Career anchors as a meta-capacity in career development. In M. Coetzee (Ed.), *Psycho-social career meta-capacities: Dynamics of contemporary career development* (pp. 139–154). Dordrecht: Springer International.

Cohen, J. (1992). Quantitative methods in psychology: A power primer. *Psychological Bulletin,* 112(1), 153–159.

Cohen, R. J., Swerdlik, M. E., & Sturman, E. D. (2013). *Psychological testing and assessment: an introduction to tests and measurement*. New York, NY: McGraw-Hill.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2009)*. Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.

Cresswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage.

Cronbach, L. J. (1988). Five perspectives on validation argument. In H. Wainer & H. Braun (Eds.), *Test validity* (pp. 34-35). Hillsdale, NJ: Erlbaum.

Culie, J., Khapova, S. N., & Arthur, M. B. (2014). Careers, clusters and employment mobility: The influences of psychological mobility and organizational support. *Journal of Vocational Behavior,* 84, 164–176.

Danziger, N., Rachman-Moore, D., & Valency, R. (2008). The construct validity of Schein's career anchors orientation inventory. *Career Development International,* 13(1), 7–19.

Darcy, M. & Tracey, T, J. G. (2003). Integrating abilities and interests in career choice: maximal versus typical assessment. *Journal of Career Assessment*, 11(2), 219–237.

Darrow, J. B., & Behrend, T. S. (2017). Person–environment fit is a formative construct. *Journal of Vocational Behavior,* 103, 117–131.

Dawis, R. V. (1996). The theory of work adjustment and person–environment correspondence counselling. In D. Brown, & L. Brooks (Eds.), *Career choice and development: Applying contemporary theories to practice* (3rd ed.; pp. 75–120). San Francisco, CA: Jossey-Bass.

Dawis, R. V. (2005). The Minnesota theory of work adjustment. In S. D. Brown, & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (pp. 3–23). New York: Wiley.

Dawis, R. V., England, G. W., & Lofquist, L. H. (1964). A theory of work adjustment. *Minnesota Studies in Vocational Rehabilitation,* 15, 1–27.

Dawis, R. V., & Lofquist, L. H. (1984). *A psychological theory of work adjustment: An individual-differences model and its applications*. Minneapolis, MN: University of Minnesota Press.

Dawis, R. V., & Lofquist, L. H. (1993). From TWA to PEC. *Journal of Vocational Behavior,* 43, 113–121.

De Lange, A. H., Kooij, D. T. A. M., & Van der Heijden, B. I. J. M. (2015). Human resource management and sustainability at work across the lifespan: An integrative perspective. In L. Finkelstein, D. M. Truxillo, F. Fraccaroli, & R. Kanfer (Eds.), *Facing the challenges of a multi-age workforce: A use-inspired approach* (pp. 50–79). New York, NY: Society for Industrial and Organizational Psychology (SIOP) Routledge.

De Lisle, J. (2011). The benefits and challenges of mixing methods and methodologies: Lessons learnt from implementing qualitatively led mixed methods research designs in Trinidad and Tobago. *Caribbean Curriculum,* 18, 87–120.

Deng, C. P., Armstrong, P. I., & Rounds, J. (2007). The fit of Holland's RIASEC model to US occupations. *Journal of Vocational Behavior,* 71, 1–22. Retrieved from doi:10.1016/j.jvb.2007.04.002.

Denzin, N. K., & Lincoln, Y. S. (1994). *Handbook of qualitative research*. London: Sage.

Department of Higher Education and Training. (2013). *The Organising Framework for Occupations.* Retrieved from http://www.wrseta.org.za/downloads/ OFO_Version_2013

Department of Higher Education and Training. (2015). *The Organising Framework for Occupations.* Retrieved from https://www.mqa.org.za/sites/default/files/ OFO%20Guidelines%20-%202015.pdf.

Department of Higher Education and Training. (2017). *The Organising Framework for occupations.* Retrieved from https://webapps.dhet.gov.za/OFORegister/ Documents/Comprehensive_Report_Version_2017.xlsx.

Department of Higher Education and Training. (2016). *Competency framework for career development practitioners in South Africa.* Retrieved from https://www.careerhelp.org.za/sites/default/files/competency_framework_colour_wp_pri nt_0.pdf.

Department of Higher Education and Training. (2018). *An integrated career development system for South Africa.* Retrieved from https://www.bankseta.org.za/wp-content/uploads/2018/11/AN-INTEGRATED-CAREER-DEVELOPMENT-SYSTEM-FOR-SOUTH-AFRICA.pdf.

De Vellis, R. F. (2003). *Scale Development: Theory and Applications* (2nd ed., Vol. 26). Thousand Oaks, CA: Sage Publications.

De Vellis, R. F. (2016). *Scale development: Theory and applications (Applied social research methods*) (4th ed.). Thousand Oaks, CA: Sage.

De Vos, A., Dujardin, J. -M., Gielens, T., & Meyers, C. (2016). *Developing sustainable careers across the lifespan.* Cham: Switzerland: Springer International.

De Vos, A., & Soens, N. (2008). Protean attitude and career success: The mediating role of self-management. *Journal of Vocational Behavior,* 73, 449–456.

De Vos, A., & Van der Heijden, B. I. J. M. (2015). *Handbook of research on sustainable careers.* Northampton, MA: Edward Elgar.

Dik, B. J., Strife, S. R., & Hansen, J. C. (2010). The flip side of Holland type congruence: Incongruence and job satisfaction. *The Career Development Quarterly,* 58, 352–358.

Dongre, A. R., & Sankaran, R. (2016). Ethical issues in qualitative research: challenges and options. *International Journal of Medical Science and Public Health*, 5, 1187–1194.

Donnelly, C. (2009). *An investigation into the measurement invariance of the performance index. Stellenbosch* (Unpublished dissertation). University of Stellenbosch, Stellenbosch, South Africa.

Donnelly, C. (2010). *Research report on the Campbell Interest and Skill Survey, Skill measurement model technical review* (Unpublished technical review document). Johannesburg: JvR Group.

Du Toit, R. & de Bruin, G.P. (2002) The Structural Validity of Holland's R-I-A-S-E-C Model of Vocational Personality Types for Young Black South African Men and Women. *Journal of Career Assessment*, 10, 62-77. Retrieved from https://doi.org/10.1177/1069072702010001004.

Edwards, J. R., & Cooper, C. L. (1990). The person ‑ environment fit approach to stress: Recurring problems and some suggested solutions. *Journal of Organizational Behavior,* 11(4), 293–307.

Eggerth, D. E. (2008). From theory of work adjustment to person–environment correspondence counseling: Vocational psychology as positive psychology. *Journal of Career Assessment,* 16(1), 60–74.

Ellingson, L. L. (2014). The truth must dazzle gradually: Enriching relationship research using a crystallization framework. *Journal of Social and Personal Relationships*, 31(4), 442–450.

Enache, M., Sallan, J. M., Simo, P., & Fernandez, V. (2011). Examining the impact of protean and boundaryless career attitudes upon subjective career success. *Journal of Management & Organization,* 17, 459–473.

Ertürk, A., & Vurgun, L. (2015). Retention of IT professionals: Examining the influence of empowerment, social exchange, and trust. *Journal of Business Research,* 68(1), 34–46.

Feldman, D. C., & Bolino, M. C. (1996). Careers within careers: Reconceptualizing the nature of career anchors and their consequences. *Human Resource Management Review,* 6, 89–112.

Filmer, S. (2015). *Career frameworks: Challenges, barriers and innovations.* Berlin: Mercer.

Foutch, H., McHugh, E. R., Bertoch, S. C., & Reardon, R. C. (2014). Creating and using a database on Holland's theory and practical tools. *Journal of Career Assessment*, *22*, 188–202.

Foxcroft, C. (2004). Planning a psychological test in the multicultural South African context. *SA Journal of Industrial Psychology,* 30(4), 8–15.

Froehlich, D. E., Beausaert, S., Segers, M. & Gerken, M. (2014). Learning to stay employable. *Career Development International,* 19(5), 508–525.

Fugate, M. (2006). Employability in the new millennium. In J. H. Greenhaus, & G. A. Callanan (Eds.), *Encyclopedia of career development* (pp. 267–270). Thousand Oaks, CA: Sage.

Fugate, M, Kinicki, A. J. & Ashforth, B.E. (2004). Employability: A psycho-social construct, its dimensions, and applications. *Journal of Vocational Behavior*, 65, 14–38.

Fukunaga, N., Okada, Y., Konishi, Y., Murashita, T., Yuzaki, M., Shomura, Y., & Koyama, T. (2012). Clinical outcomes of redo valvular operations: A 20-year experience. *The Annals of Thoracic Surgery,* 94(6), 2011–2016

Ganiron Jr., T. U. (2013). Social capital and career success of civil engineers towards designing career paths. *Social and Behavioral Sciences,* 102*,* 611–621.

Garson, G. D. (2014). *Multiple regression.* Asheboro, NC, USA: G. David Garson and Statistical Associates Publishing.

Gati., I. & Levin, N. (2014). Counseling for career decision‑making difficulties: Measures and methods. *The Career Development Quarterly*, 62(2), 98-113.

Ghasemi., A. & Zahediasl, S. (2012). Normality tests for statistical analysis: A guide for non-statisticians. *Int Journal for Endocrinol Metabolism*, 10(2), 486-489.

Ghazali, C, M. (2016). A reliability and validity of an instrument to evaluate the school-based assessment system: a pilot study. *International Journal of Evaluation and Research in Education*, 5(2), 148-157.

Ginevra, M. C., Annovazzi, C., Santilli, S., Di Maggio, I., & Camussi, E. (2018). Breadth of vocational interests: The role of career adaptability and future orientation. *The Career Development Quarterly,* 66, 233–245.

Goldstein, D., & Hilliard, R. (2007). Creating organisational capabilities: Learning by doing. In *Proceedings of OLKC 2007: "Learning Fusion"* (pp. 304–320). Retrieved from http://www2.warwick.ac.uk/fac/soc/wbs/conf/olkc/archive/olkc2/papers/goldstein_and_hilliard.

Gottfredson, G.D. & Duffy, R.D. (2008). Using a Theory of Vocational Personalities and Work Environments to Explore Subjective Well-Being. *Journal of Career Assessment*, 16 (1), 44-59.

Gottfredson, G. D., & Holland, J. L. (1996). *Dictionary of Holland occupational codes.* Florida: Psychological Assessment Resources.

Gottfredson, G. D., & Johnstun, M. L. (2009). John Holland's contributions: A theory-ridden approach to career assistance. *The Career Development Quarterly,* 58, 99–107.

Gray, D. E. (2014). *Doing research in the real world.* London: Sage.

Greene, J. C., Caracelli. V.J. & Graham, W. F. (1989). *Educational Evaluation and Policy Analysis*, 11(3), 255-274.

Greenhaus, J. H., Callanan, G. A., & Godshalck, M. (2010). *Career management.* London: Sage.

Gubler, M., Biemann, T., Tschopp, C., & Grote, G. (2015). How career anchors differentiate managerial career trajectories: A sequence analysis perspective. *Journal of Career Development,* 42(5), 412–430.

Guilbert, L., Bernaud, J., Gouvernet, B., & Rossier, J. (2016). Employability: Review and research prospects. *International Journal of Educational Vocational Guidance,* 16, 69–89. Retrieved from doi:10.1007/s10775-015-9288-4.

Guion, L. A., Diehl, D. C., & McDonald, D. (2011). *Triangulation: Establishing the validity of qualitative studies.* University of Florida: IFAS Extension. Retrieved from http://www.ie.ufrj.br/intranet/ie/userintranet/hpp/arquivos/texto.

Gysbers, N. C., Heppner, M. J., & Johnston, J. A. (2003). *Career counselling: Process, issues and techniques.* Boston, MA: Pearson Education.

Hadad, S. (2017). Knowledge economy: Characteristics and dimensions. *Management Dynamics in the Knowledge Economy,* 5(2), 203–225.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). London: Pearson Prentice-Hall.

Hall, D. T. (2002). *Careers in and out of organizations.* Thousand Oaks, CA: Sage.

Handel, M. J. (2016). *The O*NET content model: Strengths and limitations.* Springerlink.com. Retrieved from doi 10.1007/s12651-016-0199-8.

Harman, H. H. (1960). *Modern factor analysis.* Chicago, IL. University of Chicago Press.

Hansen, J. C. (2013). Nature, importance, and assessment of interests. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (2nd ed.; pp. 387–416). Hoboken, NJ: Wiley.

Harrington, T., & Long, J. (2013, March). The history of interest inventories and career assessments in career counselling. *The Career Development Quarterly,* 61(1), 83–92.

Hartung, P. J. (2007). Career construction: principles and practice. In K. Maree (Ed.), *Shaping the story: A guide to facilitating narrative counselling* (pp. 103–120). Pretoria: Van Schaik.

Hartung, P. J., & Cadaret, M. C. (2017). Career adaptability: changing self and situation for satisfaction and success. In K. Maree (Ed.), *Psychology of career adaptability, employability and resilience*. Dordrecht: Springer International Retrieved from Doi:10.1007/978-3-319-66954-0_2.

Hartung, P. J., & Vess, L. (2016). Critical moments in career construction counselling. *Journal of Vocational Behavior,* 97, 31-39.

Herrmann, A., Hirschi, A. & Baruch, Y. (2015). The protean career orientation as predictor of career outcomes: Evaluation of incremental validity and mediation effects. Journal of Vocational Behavior, 88, 205-214.

Heale, R. & Twycross, A. (2015). Validity and reliability in quantitative research. Evidence-Based Nursing, 8(3), 66-67.

Heijungs, R., Henriksson, P.J.G. & Guinée, J. B. (2016). Measures of difference and significance in the era of computer simulations, meta-analysis, and big data. *Entropy*, 18(10), 361, Retrieved from doi:10.3390/e18100361.

Hirschi, A., Herrmann, A., & Keller, A. C. (2015). Career adaptivity, adaptability, and adapting: A conceptual and empirical investigation. *Journal of Vocational Behavior,* 87, 1–10.

Holland, J. L. (1972). *The Self-Directed Search: Professional manual*. Palo Alto, CA: Consulting Psychologists Press.

Holland, J. L. (1973). *Making vocational choices*. Englewood Cliffs, NJ: Prentice-Hall.

Holland, J. L. (1985). *Making vocational choices: A theory of vocational personalities and work environments* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Holland, J. L. (1994). *Self-Directed Search: Form R assessment booklet*. Odessa, FL: Psychological Assessment Resources.

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources.

Hooley, T., & Borbely-Pecze, T. B. (2017). *Understanding how work opportunities are changing*. Seoul: 8th ICCDPP International Symposium. Retrieved from https://cica.org.au/wp-

content/uploads/ICCDPP-Understanding-how-work-opportunites-are-changing-2017.pdf.

InfoCareers. (2014). *IDEAS interest inventory Counselor's manual*. USA, University of Oregon: InfoCareers.

International Labour Organization. (2012). *International standard classification of occupations: Structure, group definitions and correspondence tables*. Geneva: International Labour Office.

James R. & Gilliland B. (2003). *Crisis Intervention Strategies*. Belmont: Wadsworth Publishing Company.

Jaques, E. 1989. *Requisite organization*. Virginia: Cason Hall.

Jaques, E. 1996. *Requisite organisation*. Gloucester, MA: Cason Hall.

Jaques, E., & Cason, K. (1994). *Human capability: A study of individual potential and its application*. Virginia: Cason Hall.

Jelsma, J., & Clow, S. (2005). Ethical issues relating to qualitative research. *SA Journal for Physiotherapy*, 61(1), 3–6.

Johansson, C. B. (2007). *Interest Determination, Exploration and Assessment System® (IDEAS)*. Retrieved from https://jvrafricagroup.co.za/catalogue/assessment/interest-determination-exploration-and-assessment-system-ideas/

Johnson, R. Burke, Anthony J. Onwuegbuzie, and Lisa A. Turner. 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2),112–133.

Kane, M. (2011). Content-related validity evidence in test development. In S. M. Downing, & T. M. Haladyna (Eds.), *Handbook for test development* (pp. 131–153). London: Lawrence Erlbaum Associates.

Kang, Z., Kim, H., & Trusty, J. (2017). Constructivist and social constructionist career counseling: A Delphi study. *The Career Development Quarterly,* 65, 72–87.

Keith, T. Z. (2014). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling*. New York, NY: Routledge.

Kemp, S., Hollowood, T., & Hort, J. (2011). *Sensory evaluation: A practical handbook*. Oxford, UK: John Wiley & Sons.

Khan, S. A., Rajasekar, J. & Al-Asfour, R. (2015). Organizational career development practices: Learning from an Omani company. *International Journal of Business and Management*, 10(9), 88-98.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford Press.

Klupáková, H. (2013). *Overview of the characteristics of career concepts. EMI*, 5(1), 16–23.

Korsakiene, R., & Smaliukiene, R. (2014). The implications of contemporary approaches toward career development. *Social and Behavioral Sciences,* 109, 422–426.

Kniveton, B. H. (2004). Managerial career anchors in a changing business environment. *Journal of European Industrial Training,* 28(7), 564–573.

Koys, D. (2013). Using the Department of Labor's O*NET database in teaching HRM. *Journal of Human Resources Education,* 7(3/4), 1–21.

Kristof-Brown, A. L., & Guay, R. P. (2011). Person–environment fit. In S. Zedeck (Ed.), *American Psychological Association handbook of industrial and organizational psychology* (3rd ed., pp. 3–50). Washington DC: American Psychological Association.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology,* 58, 281–342.

Kuplennik, N., Tchoudakov, R., Zelas, Z. B. B., Sadovski, A., Fishman, A., & Narkis, M. (2015). Antimicrobial packaging based on linear low-density polyethylene compounded with potassium sorbate. *LWT-Food Science and Technology,* 62(1), 278–286.

Latour, J. M., Van Goudoever, J. B., Duivenvoorden, H. J., Albers, M. J., Van Dam, N. A., Dullaart, E., & Hazelzet, J. A. (2011). Construction and psychometric testing of the EMPATHIC questionnaire measuring parent satisfaction in the pediatric intensive care unit. *Intensive Care Medicine,* 37(2), 310–318.

Lee, J. (2014). An exploratory study of effective online learning: Assessing satisfaction levels of graduate students of mathematics education associated with human and design factors

of an online course. *The International Review of Research in Open and Distributed Learning,* 15(1). Retrieved from https://doi.org/10.19173/irrodl.v15i1.1638.

Leedy, P. D., & Ormrod, J. E. (2005). *Practical research planning and design* (8th ed.). New Jersey: Pearson Prentice Hall.

Lent, R. (2018). Future of work in the digital world: Preparing for instability and opportunity. *The Career Development Quarterly*, 66, 205-219.

Leong, F. T. L, Rosenberg, S. D., & Chong, S. (2014). A psychometric evaluation of Schein's (1985) career orientations inventory. *Journal of Career Assessment, 22*(3), 524–538.

Leung, C., Tsang, S. & Dean, S. (2010). Evaluation of a program to educate disadvantaged parents to enhance child learning. *Research on Social Work Practice*, 20, 591-599.

Lewis, J. L., & Sheppard, S. R. J. (2006). Culture and Communication: Can Landscape Visualization Improve Forest Management Consultation with Indigenous Communities? *Landscape and Urban Planning*, 77, 291-313.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. London, UK: Sage.

Liu, Z., & Chen, G. (2103). *Theory of boundaryless career and employability training in higher education*. International Conference on Education Technology and Management Science (ICETMS 2013).

Lochab, A., & Mor, K. (2013). Traditional to boundaryless career: Redefining career in 21st century. *Global Journal of Management and Business Studies,* 3(5), 485–490.

Luedtke, A. R., & Van der Laan, M. J. (2016). Statistical inference for the mean outcome under a possibly non-unique optimal treatment strategy. *The Annals of Statistics* 44(2), 713–742.

Lysaght, Z. (2015). Assessment for learning and for self-regulation. *International Journal of Emotional Education,* 7(1), 20.

Maatoug, J., Sahli, J., Harrabi, I., Chouikha, F., Hmad, S., Dendana, E., & Ghannem, H. (2016). Assessment of the validity of self-reported smoking status among schoolchildren in Sousse, Tunisia. *International Journal of Adolescent Medicine and Health,* 28(2), 211–216.

Macur, M., Király, O., Maraz, A., Nagygyörgy, K., & Demetrovics, Z. (2016). Prevalence of problematic internet use in Slovenia. *Slovenian Journal of Public Health*, 55(3), 202–211. Retrieved from doi:10.1515/sjph-2016-0026

Malinowsky, C., & Larsson-Lund, M. (2016). The match between everyday technology in public space and the ability of working-age people with acquired brain injury to use it. *British Journal of Occupational Therapy,* 79(1), 26–34.

Maree, J. G. (2008). *Manual for the Career Interest Profile*. Randburg, South Africa: JvR Psychometrics.

Maree, J. G. (2013). Latest developments in career counselling in South Africa: Towards a positive approach. *South African Journal of Psychology,* 43(4), 409–421.

Maree, J. G., & Taylor, N. (2016). *Development of the Maree Career Matrix: A new interest inventory. South African Journal of Psychology*, 46(4), 462–476.

Marshall, V. & Bonner, D. (2003). Career anchors and the effects of downsizing: implications for generations and cultures at work, a preliminary investigation. *Journal of European Industrial Training*, 27(6), 281-291.

Martin, C. R., & Savage-McGlynn, E. (2013). A "good practice" guide for the reporting of design and analysis of psychometric evaluation. *Journal of Reproductive and Infant Psychology,* 31(5), 449–455.

McDaniel, M. A., & Snell, A. F. (1999). Holland's theory and occupational information. *Journal of Vocational Behavior*, 55(1), 74-85.

McMahon, M., & Patton, W. (2015). Incorporating career assessment into career counselling. In M. McMahon, & M. Watson (Eds.), *Career assessment: Qualitative approaches* (pp. 49–58. Boston, MA: Sense Publishers.

McMahon, M., Watson, M., & Patton, W. (2015). The systems theory framework of career development: Applications to career counselling and career assessment. *Australian Journal of Career Development,* 24(3), 148–156.

McMahon, M., & Watson, M. (2009). Career psychology research challenges: A systems theory response. *South African Journal of Psychology,* 39(2), 184–194.

McMillan, J. H., & Schumacher, S. (2009). *Research in education: Evidence-based inquiry*. New York, NY: Addison-Wesley Longman.

McNeese-Smith, D., & Van Servellen, G. (2000). Age, development and job stages: Impact on nurse outcomes. *Outcomes Management for Nursing Practice,* 4(2), 97–104.

Medlock, G. (2012). The evolving ethic of authenticity: From humanistic to positive psychology. *The Humanistic Psychologist,* 40, 38–57.

Melnykov, V., & Maitra, R. (2010). Finite mixture models and model-based clustering. *Statistics Surveys,* 4, 80–116.

Memon, M. A., Salleh, R., & Baharom, M. N. R. (2015). Linking person–job fit, person-organization fit, employee engagement and turnover intention: A three-step conceptual model. *Asian Social Science,* 11(2), 313-320.

Messick, S. (1989). Meaning and Values in Test Validation: The Science and Ethics of Assessment. *Educational Researcher*, 18(2), 5-11.

Metz, A. J., & Jones, E. (2013). Ability and aptitude assessment in career counseling. In S. D. Brown, & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (2nd ed., pp. 449–476). Hoboken, NJ: Wiley.

Meyer, T. (2010). *Organisational capabilities: The essential ingredient to strategy implementation*. Retrieved from http://www.leadershipsa.com/downloads/ Organisational%20 Capabilities.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis*. Thousand Oaks, CA: Sage.

Miller, L.A., Lovler, R. L., & McIntire, S. A. (2013). *Foundations of psychological testing: A practical approach*. London: Sage.

Minnesota State Colleges and Universities. (2010). *Minnesota career fields, clusters & pathways.* Minnesota Department of Education. Retrieved from http://www.ffa.umn.edu/ Advisors/Homepage/Wheel%20Framework%20Final%2011-07-07.

Morgado, F. F. R., Meireles, J. F. F., Neves, C. M., Amaral, A. C. S., & Ferreira, M. E. C. (2017). Scale development: Ten main limitations and recommendations to improve future research practices. *Morgado et al. Psicologia: Reflexão e Crítica,* 30(3). Retrieved from doi:10.1186/s41155-016-0057-1.

Morgan, B., De Bruin, G. P., & De Bruin, K. (2015). Constructing Holland's hexagon in South Africa: Development and initial validation of the South African Career Interest Inventory, *Journal of Career Assessment,* 23(3), 493–511.

Morgan, B., & De Bruin, G. P. (2018). Structural validity of Holland's circumplex model of vocational personality types in Africa. *Journal of Career Assessment,* 26(2), 275–290.

Mouton, J. (2001). *How to succeed in your master's and doctoral studies: A South African guide and resource book*. Pretoria: Van Schaik.

Mouton, J., & Marais, H. C. (1996). *Basic concepts in the methodology of the social sciences* (5th ed.). Pretoria: HSRC.

Mulhall, S. (2014). Careers and Career Development. In Harney, B. and Monks, K. (eds.) *Strategic HRM: Research and Practice in Ireland* (pp. 211-229). Dublin, Orpen Press.

National Center for O*NET Development. *Abilities*. O*NET OnLine. Retrieved from https://www.onetonline.org/find/descriptor/browse/Abilities/.

Nauta, M. M. (2013). Holland's theory of vocational choice and adjustment. In S. D. Brown & R. W. Let (Eds.), *Career development and counseling: Putting theory and research to work* (2nd ed., pp. 55–82). Hoboken, NJ: Wiley.

Nebel, S., Schneider, S., & Rey, G. D. (2016). From duels to classroom competition: Social competition and learning in educational videogames within different group sizes. *Computers in Human Behavior,* 55, 384–398.

Neimeyer, R.A. & Stewart, A.E. (2002). *Handbook of Posttraumatic Growth: Research and Practice.* NY: Psychology Press.

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications.* Thousand Oaks, CA: Sage Publications.

Nishanthi, H. M. (2016). Modern career concepts: A review. *International Journal of Scientific and Research Publications,* 6(3), 1–5.

Nizalova, O. Y., & Murtazashvili, I. (2016). Exogenous treatment and endogenous factors: Vanishing of omitted variable bias on the interaction term. *Journal of Econometric Methods,* 5(1), 71–77.

Nordvik, H. (1991). Work activity and career goals in Holland's and Schein's theories of vocational personalities and career anchors. *Journal of Vocational Behavior,* 38, 165–178.

Nordvik, H. (1996). Relationships between Holland's vocational typology, Schein's career anchors and Myers-Briggs' types. *Journal of Occupational and Organizational Psychology,* 69, 263–275.

Nye, C. D., Butt, S. M. Bradburn, J., & Prasad, J. (2018). Interests as predictors of performance: An omitted and underappreciated variable. *Journal of Vocational Behavior*, 108, 178–189.

Nye, C. D., Su, R., Rounds J., & Drasgow, F. (2017). Interest congruence and performance: Revisiting recent meta-analytic findings. *Journal of Vocational Behavior*, 98, 138–151.

OECD. (1996). *The knowledge-based economy*. Retrieved from https://www.oecd.org/sti/sci-tech/1913021.pdf.

Ogara, S. O., Koh, C. E., & Prybutok, V. R. (2014). Investigating factors affecting social presence and user satisfaction with mobile instant messaging. *Computers in Human Behavior,* 36, 453–459.

O*NET Centre. (2007). *O*NET Occupations reference guide*. Retrieved from http://www.o*netcenter.org.

O*NET Data Dictionary, version 19.0. (2014). *National Center for O*NET Development*. Raleigh, NC. Retrieved from https://www.o*netcenter.org/dl_files/DataDictionary19_0.pdf.

Oracle. (2012). *Talent retention: Six technology-enabled best practices*. Redwood Shores, CA: Oracle Corporation.

Orb, A., Eisenhauer, L., & Wynaden, J. (2000). Ethics in qualitative research. *Journal of Nursing Scholarship,* 33(1), 93–96.

Ostroff, C. S., Shin, Y. & Feinberg, B. (2002). Skill acquisition and person–environment fit. In D. C. Feldman (Ed.), *Work careers: A developmental approach* (pp. 63–90). San Francisco, CA: Jossey-Bass.

Pallant, J. (2013). *SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS*. Sydney: Allen & Unwin.

Parsons, F. (1909). *Choosing a vocation*. Boston: Houghton Mifflin.

Paterson, H., & Uys, K. (2005). Critical issues in psychological test use in the South African workplace. *SA Journal of Industrial Psychology,* 31(3), 12–22.

Patrzek, J., Grunschel, C., Koenig, N., & Fries, S. (2015). Questionnaire on reasons for academic procrastination: Development and first validation. *Diagnostica,* 61(4), 184196.

Patton, M. Q. (2002). Two decades of developments in qualitative inquiry. *Qualitative Social Work,* 1(3), 261–283.

Patton, W., & McMahon, M. (2006). The systems theory framework of career development and counseling: Connecting theory and practice. *International Journal for the Advancement of Counselling,* 28(2), 153–166.

Patton, W., & McMahon, M. (2015). *Career development and systems theory: Connecting theory and practice* (3rd ed.). Rotterdam, The Netherlands: Sense.

Peterson, N.G., Mumford, M.D, Borman, W. & Jeanneret, P.R. (2001). Understanding Work Using the Occupational Information Network (O*NET): Implications for Practice and Research. *Personnel Psychology*, 54(2), p. 451-492.

Peterson, J., & Roger, A. (2009). *Career anchor profiles: an exploratory study of business school participants in France*. Colloque international sur les indicateurs d'évaluation de la responsabilité sociale et environnementale des entreprises, 8-10 Juin 2009, Lyon, Université Jean Moulin Lyon 3, France.

Petty, N.J, Thomson, O.P, & Stew G. (2012). *Ready for a paradigm shift? Part 1: Introducing the philosophy of qualitative research*. Manual Therapy, doi:10.1016/j.math.2012.03.006.

Phan, W. M. J., & Rounds, J. (2018). Examining the duality of Holland's RIASEC types: Implications for measurement and congruence. *Journal of Vocational Behavior,* 106*,* 22–36.

Ployhart, R. E., & P. D. Bliese (2006). Individual Adaptability (I-Adapt) theory: Conceptualizing the antecedents, consequences, and measurements of individual differences in adaptability. *Advances in Human Performance and Cognitive Engineering Research,* 6*,* 3–39.

Prediger, D. J. (2002). Abilities, interests, and values: Their assessment and their integration via the world-of-work map. *Journal of Career Assessment,* 10, 209–232.

Pryor, R. G. L., & Bright, J. E. H. (2003). Order and chaos: A twenty-first century formulation of careers. *Australian Journal of Psychology,* 55(2), 121–128.

Pryor, R. G. L., & Bright, J. E. H. (2009). Good hope in chaos: Beyond matching to complexity in career development. *South African Journal of Higher Education,* 23(3), 521–536.

Psytech International. (2012). *Extended (O*NET) report*. UK: Psytech.

QBIT. (2010). *Standard Integrated People Practice (SIP®) Standards*. QBIT: Johannesburg.

Reardon, R.C., & Lenz, J.G. (1998). *The Self-Directed Search & Related Holland Career Materials: A Practitioner's Guide.* US: Psychological Assessment Resources Inc.

Reardon, R. C. (2017). Holland's integration of career theory, research, and practice. In J. P. Sampson, E. Bullock-Yowell, V. C., Dozier, D. S. Osborn, & J. G. Lenz (Eds.), *Integrating theory, research, and practice in vocational psychology: Current status and future directions* (pp. 28–39). Tallahassee, FL: Florida State University Libraries. Retrieved from http://journals.fcla.edu/svp2016/.

Richardson, L. (2000). Writing: A method of inquiry. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 923–943). Thousand Oaks, CA: Sage.

Robinson, C., & Betz, N. (2008). A psychometric evaluation of Super's Work Values Inventory-Revised. *Journal of Career Assessment*, 16, 456-473.

Rocha, M. (2012). Transferable skills representations in a Portuguese college sample: Gender, age, adaptability and vocational development. *European Journal of Psychology of Education, 27*, 77–90. Retrieved from doi:10.1007/s10212-011-0067-4.

Rodrigues, R., Butler, C. L., & Guest, D. (2019). Antecedents of protean and boundaryless career orientations: The role of core self-evaluations, perceived employability and social capital. *Journal of Vocational Behavior, 110*, 1–11.

Rodrigues, R, Guest, D., & Budjanovcanin, A. (2013). From anchors to orientations: Towards a contemporary theory of career anchor preferences. *Journal of Vocational Behavior, 83*(2), 142–152. Retrieved from doi:10.1016/j.jvb.2013.04.002.

Rogers, C. R. (2004). *On becoming a person*. London: Constable.

Rosenthal, R., & Rosnow, R. L. (2009). *Artifacts in behavioral research*. New York: Oxford University Press.

Rothwell, W. J., Jackson, R. D., Knight, S. C., Lindhold, J. E., Wang, W. A., & Payne, T. D. (2005). *Career planning and succession management: Developing your organization's talent – today and tomorrow*. Westport, CT: Praeger.

Rounds, J., & Su, R. (2014). The nature and power of interests. *Current Directions in Psychological Science,* 1–6. Retrieved from https://education.illinois.edu/docs/default-source/edpsy-documents/rounds-pub.pdf?sfvrsn=8eb1b786_0.

Rounds, J. B., & Tracey, T. J. (1990). From trait-and-factor to person environment fit counseling: Theory and process. In W. B. Walsh, & S. J. Osipow (Eds.), *Career counseling: contemporary topics in vocational psychology* (pp. 1–44). Hillsdale, NJ: Erlbaum.

Rowley, J. (2014). Designing and using research questionnaires. *Management Research Review*, 37(3), 308-330.

Sackett, P. R., & Laczo, R. M. (2003). Job and work analysis. In D. R. Ilgen, & W. C. Borman, (Eds.), *Handbook of psychology: Industrial and organizational psychology (Vol. 12).* New York, NY: Wiley.

Salminen, H. (2012). Turning the tide: Registered nurses' job withdrawal intentions in a Finnish university hospital. *SA Journal of Human Resource Management*, 10(2), 11 pages. Retrieved from doi:https://doi.org/10.4102/sajhrm.v10i2.410.

Saraiva, L., Rodrigues, L. P., Cordovil, R., & Barreiros, J. (2013). Motor profile of Portuguese preschool children on the Peabody Developmental Motor Scales-2: A cross-cultural study. *Research in Developmental Disabilities,* 34(6), 1966–1973.

SAS version 9.4. (SAS, Inc., 2013). *Statistical Analysis System, Version 6.1.* Cary, NC: SAS Institute.

Savari, M., Eslami, M. & Monavarifard, F. (2013). The Impact of Social Capital on Agricultural Employees' Job Satisfaction, City of Divandarreh. *International Research Journal of Applied and Basic Sciences*, 4 (2), 291-295.

Savickas, M. L. (2005). The theory and practice of career construction. In S. D. Brown, & R. W. Lent (Eds.), *Career development and counselling: Putting theory and research to work* (pp. 42–70). Hoboken, NJ: John Wiley & Sons.

Savickas, M. L. (2011). *Career counselling.* Washington, DC: American Psychological Association.

Savickas, M. L. (2012). Life design: A paradigm for career intervention in the 21st century. *Journal of Counseling and Development,* 90, 13–19.

Savickas, M. L. (2013). Career construction theory and practice. In S. D. Brown, & R. W. Lent (Eds)*, Career development and counseling: Putting theory and research to work* (pp. 147–183). Hoboken, NJ: Wiley.

Savickas, M. L., & Porfeli, E. J. (2012). Career Adapt-Abilities Scale: Construction, reliability, and measurement equivalence across 13 countries. *Journal of Vocational Behavior,* 80, 661–673. Retrieved from doi:10.1016/j.jvb.2012.01.011.

Schein, E. H. (1978). *Career dynamics: Matching individual and organisational needs*. Reading, MA: Addison Wesley.

Schein, E. H. (1985). *Career anchors: Discovering your real values*. San Diego, CA: University Associates.

Schein, E. H. (1990). *Career anchors: Discovering your real values.* San Francisco, CA: Jossey-Bass Pfeiffer.

Schein, E. H. (1996). Career anchors revisited: Implications for career development in the 21st century. *Academy of Management Executive,* 1, 80–88.

Schein, E. H. (2006). Career anchors. In J. H. Greenhaus, & G. A. Callanan (Eds.), *Encyclopedia of career development* (pp. 63–69). Thousand Oaks, CA: Sage.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of psychological research online*, 8(2), 23-74.

Schoonenboom, J. & Johnson, R. R. (2017). How to construct a mixed methods research design. KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie, 69(2), 107–131. Retrieved from DOI 10.1007/s11577-017-0454-1.

Schneider, J., & McGrew, K. (2013). *The Cattell-Horn-Carroll (CHC): Model of Intelligence v2.2: a visual tour and summary*. St Cloud, MN: Institute for Applied Psychometrics.

Schreuder, A. M. G., & Coetzee, M. (2011). *Careers: An organisational perspective* (4th ed.). Cape Town: Juta.

Schreuder, A. M. G., & Coetzee, M. (2016). *Careers: An organisational perspective* (5th ed.). Cape Town: Juta.

Sharf, R. S. (2010). *Applying career development theory to career counselling* (5th ed.). Belmont, CA: Cengage Learning.

Sharma, G. 2017. Pros and cons of different sampling techniques. *International Journal of Applied Research,* 3(7), 749–752.

Sharma, P. 2016. Theories of career development: Educational and counseling implications. *The International Journal of Indian Psychology*, 3(4), 214–223.

Shoffner, M. F. (2006). Career counselling: theoretical perspectives. In D. Capuzzi, & M. D. Staufer (Eds.), *Career counseling: Foundations, perspectives and applications* (pp. 40–68). Boston, MA: Pearson.

Sinclair-Maragh, G., Gursoy, D., & Vieregge, M. (2015). Residents' perceptions toward tourism development: A factor-cluster approach. *Journal of Destination Marketing & Management,* 4(1), 36–45.

Skillscan. (2012). *Three types of skills classification*. Retrieved from https://www.skillscan.com/sites/default/files/Three%20Types%20of%20Skills%20Classification.pdf.

Smith, J. W., Anderson, D. H., Davenport, M. A., & Leahy, J. E. (2013). Community benefits from managed resource areas. *Journal of Leisure Research,* 45(2), 192–213.

Snow, R. E. (1994). Abilities in academic tasks. In R. J. Sternberg & R. K. Wagner (Eds.), *Mind in context: Interactionist perspectives on human intelligence*, 3–37. New York: Cambridge University Press.

South African Board for People Practices (SABPP). (2017). *HR professional practice standards: HR standards update*. Johannesburg: SABPP.

Soylu, K., Yuksel, S., Gulel, O., Erbay, A. R., Meric, M., Zengin, H., & Demircan, S. (2013). The relationship of coronary flow to neutrophil/lymphocyte ratio in patients undergoing primary percutaneous coronary intervention. *Journal of Thoracic Disease,* 5(3), 258–264.

Stergiou, D., Airey, D., & Riley, M. (2008). Making sense of tourism teaching. *Annals of Tourism Research*, 35(3), 631–649.

Stone, K. B. (2015). Burke-Litwin organizational assessment survey: Reliability and validity. *Organization Development Journal,* 33(2), 33–50.

Strydom, E. (2015). *A multidimensional customer value model for the high fashion retail industry* (Thesis). University of Johannesburg, Johannesburg.

Su, R., Murdock, C. D., & Rounds, J. (2015). Person–environment fit. In P. J. Hartung, M. L. Savickas, & W. B. Walsh (Eds.), *APA Handbook of Career Interventions* (pp. 81–98). Washington, DC: American Psychological Association.

Super, D. E. (1990). A lifespan, life-space approach to career development. In D. Brown, L. Brooks, & Associates. *Career choice and development* (2nd ed., pp. 197–261). San Francisco, CA: Jossey-Bass.

Suutari, V., & Taka, M. (2004). Career anchors of managers with global careers. *Journal of Management Development,* 23(9), 833–847.

Swanson, J. L., & Schneider, M. (2013). Minnesota theory of work adjustment. In S. D. Brown & R. W. Lent (Eds.), C*areer development and counseling: Putting theory and research to work* (2nd ed., pp. 29–53). New York: Wiley.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55.

Taylor, N., & Donnelly, C. (2017). *Interest and Skill measurement in parallel: The Campbell Interest and Skill Survey* (Unpublished technical review document). Johannesburg: JvR Group.

Templin, J., & Bradshaw, L. (2014). The use and misuse of psychometric models. *Psychometrika,* 79(2), 347–354.

Terre Blanche, M., Durrheim, K., & Painter, D. (2006). *Research in practice: Applied methods for the social sciences*. Cape Town: University of Cape Town.

Terrell, S. R. (2012, January). Mixed-methods research methodologies. *The Qualitative Report,* 17(1), 254–280.

Thanha, N. C., & Thanha, T. T. L. (2015). The interconnection between interpretivist paradigm and qualitative methods in education. *American Journal of Educational Science,* 1(2), 24–27.

Tiernan, P., & O'Kelly, J. (2014). Blending work and learning: The impact of a workplace learning programme on the low-skilled and long term unemployed. *Industrial and Commercial Training,* 46(7), 406–414.

Tims, M., Derks, D., & Bakker, A. B. (2011). Job crafting and its relationships with person–job fit and meaningfulness: A three-wave study. *Journal of Vocational Behavior,* 92, 44–53.

Tracy, S. J. (2010). Qualitative quality: Eight "Big-Tent" criteria for excellent qualitative research. *Qualitative Inquiry,* 16(10), 837–851.

Ucol-Ganiron Jr, T. & Malvecino-Ganiron, T. (2012). Social capital on civil engineer career success. *International Journal of Innovation, Management and Technology*, 3 (6), 718-724.

Urbanavičiūtė, I., Bagdžiūnienė, D., Lazauskaitė-Zabielskė, J., Van der Elst, T., & De Witte, H. (2015). The role of career factors in qualitative and quantitative job insecurity: A study in different organizational contexts. *International Journal of Psychology: A Biopsychosocial Approach,* 16, 23–45.

Van Dam, K. (2013). Employee adaptability to change at work: A multidimensional, resource-based framework. In S. Oreg, A. Michel, & R. T. By (Eds.), *The psychology of organizational change: Viewing change from the employee's perspective* (pp. 123–142). Cambridge, UK: Cambridge University Press.

Van der Heijde, C. M., & Van der Heijden, B. I. J. M. (2006). A competence-based and multidimensional operationalization and measurement of employability. *Human Resource Management, 45,* 449–476. Retrieved from doi:10.1002/hrm.20119.

Van Diessen, E., Numan, T., Van Dellen, E., Van der Kooi, A. W., Boersma, M., Hofman, D., & Stam, C. J. (2015). Opportunities and methodological challenges in EEG and MEG resting state functional brain network research. *Clinical Neurophysiology, 126(8)*, 1468–1481.

Van Iddekinge , C.H., Roth, P.L., Putka, D.J. & Lanivich, S.E. (2011). Are you interested? A meta-analysis of relations between vocational interests and employee performance and turnover. *Journal of Applied Psychology*, 96(6), 1167-1194.

Van Vianen, A.E.M. (2018). Person-environment fit: a review of its basic tenets. *Annual Review of Organizational Psychology and Organizational Behavior, 5,* 75-101. Retrieved from Doi: https://doi.org/10.1146/annurev-orgpsych-032117-104702.

Van Vuuren, L. J. (2010). Industrial psychology goodness of fit? Fit for goodness? *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde, 36(2*). Retrieved from doi:10.4102/sajip.v36i2.939.

Van Wijk, C.H., Fourie, M. (2017). The appropriateness of using the Self-Directed Search questionnaire in developing countries: A pilot study with South African navy divers. *Open Journal of Social Sciences*, 5, 60-69.

Vilhjálmsdóttir, G., & Tulinius, T. H. (2016). The career construction interview and literary analysis. *Journal of Vocational Behavior, 97,* 40–50.

Visser, H. (2015). *Foundations of HEMIS 2015. Qualifications and courses: Key concepts and issues.* South African Association for Institutional Research.

Vogel, R.M., Rodell, J.B., & Lynch, J.W. (2016). Engaged and productive misfits: how job crafting and leisure activity mitigate the negative effects of value incongruence. *Academy of Management Journal,* 59, 1561-1584.

Vondracek, F. W., Ford, D. H., & Porfeli, E. J. (2014). *A living systems theory of vocational behaviour and development.* The Netherlands, Rotterdam: Sense Publishers.

Vorwerk, C. (2014). *Mapping links between occupations and Classification of Educational Subject Matter (CESM).* Pretoria: Labour Market Intelligence Partnership (LMIP) Project, Human Sciences Research Council.

Wang, D. H., Wang, Z. Y., Chen, J. H., Kinchla, A. J., & Nugen, S. R. (2016). Rapid detection of Salmonella using a redox cycling-based electrochemical method. *Food Control.* 62, 81–88.

Warren, C., Dupont, J., Abdel-Moati, M., Hobeichi, S., Palandro, D., & Purkis, S. (2016). Remote sensing of Qatar nearshore habitats with perspectives for coastal management. *Marine Pollution Bulletin,* 105(2), 641–653.

Watson, M., & McMahon, M. (2015). An introduction to career assessment. In M. McMahon, & M. Watson, (Eds.), *An introduction to career assessment: Qualitative approaches.* USA, Boston, MA: Sense Publishers.

Wesarat, P., Sharif, M.Y., & Majid, A. H. A. (2014). A review of organisational and individual career management: A dual perspective. *International Journal of Human Resource Studies,* 4(1), 101–113.

Wille, B., Beyers, W., & De Fruyt, F. (2012). A transactional approach to person–environment fit: Reciprocal relations between personality development and career role growth across young to middle adulthood. *Journal of Vocational Behavior,* 81, 307–321.

Wolff, H. G., & Preising, K. (2005). Exploring item and higher order factor structure with the Schmid-Leiman Solution: Syntax codes for SPSS and SAS. *Behavior Research Methods,* 37(1), 48–58.

Wong, P. T. P. (2005). Existential and humanistic theories. In J. C. Thomas, & D. L. Segal (Eds.), *Comprehensive handbook of personality and psychopathology* (pp. 192–211). Hoboken, NJ: John Wiley & Sons.

Woo, A., Fu, T., Popovic, M., Chow, E., Cella, D., Wong, C. S., & Ganesh, V. (2016). Comparison of the EORTC STO-22 and the FACT-Ga quality of life questionnaires for patients with gastric cancer. *Annals of Palliative Medicine,* 5(1), 13–21.

Xu, L., Freeman, G., Cowling, B. J., & Schooling, C. M. (2013). Testosterone therapy and cardiovascular events among men: A systematic review and meta-analysis of placebo-controlled randomized trials. *BMC Medicine,* 11(1), 1.

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education,* 48(2), 311-325.

Yost, P. R. (2010). Integrated talent management at Microsoft. In R. Silzer, & B. E. Dowell (Eds.), *Strategy-driven talent management: A leadership imperative* (pp. 641-654). San Francisco, CA: Jossey-Bass.

Yu, K. Y. T. (2016). Inter-relationships among different types of person–environment fit and job satisfaction. *Applied Psychology: An International Review,* 65(1), 38–65.

Zarrin, S. A., Baghban, I. & Abedi, M. R. (2011). Reliability and correlation of interest inventories: Strong interest inventory (SII) and self-directed search (SDS). *International Journal of Psychology and Counselling*, 3(7), 111–116.

Zhang, Y. L., Liang, W., Chen, Z. M., Zhang, H. M., Zhang, J. H., Weng, X. Q., & Zhang, Y. L. (2013). Validity and reliability of Patient Health Questionnaire‐9 and Patient Health Questionnaire‐2 to screen for depression among college students in China. *Asia‐Pacific Psychiatry,* 5(4), 268–275.

Žukauskas, P., Vveinhardt, J. & Andriukaitienė, R. (2018). *Exploratory Research*. London: IntechOpen. Retrieved from http://dx.doi.org/10.5772/intechopen.70631.

Zunker, V. G. (2006). *Career counseling: A holistic approach* (7th ed.). Belmont, CA: Thomson Higher Education.

APPENDIX A: I-PIA-M Career Interests Items

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
1	I like to be involved in projects where I can exercise my hands-on expertise in various tasks.	X							
2	I am a results driven person and wish to influence my own progress towards predefined goals.	X							
3	Working and controlling figures has always been a keen interest of mine.	X							
4	Working and controlling budgets has always been a keen interest of mine.	X							
5	My preference is to work with customers on a one-on-one basis.							X	
6	I always perceive myself as someone who has the ability to influence and persuade others.							X	
7	Identifying customer needs would be in line with my interest in analysing and interpreting others' needs.							X	
8	Buying and selling articles and/or services is something I always wanted to do.			X					
9	I like to work with my hands in building and/or constructing electronic equipment.								X
10	I like to work with my hands in executing maintenance activities related to electronic equipment.								X
11	Driving and/or handling machinery and equipment appeals to me.	X							X
12	I would love to install electronic equipment related to the telecommunications industry.	X					X		
13	I would like to calculate wages and employee benefits in a finance department.					X			
14	Working with organisational budgets always appeal to me.	X							
15	I would like to be involved in the practical installation, maintenance and operation of electronic equipment.								X

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
16	My preference is to develop a software (computer program) product.						X		
17	Writing instructions or a manual for users and train staff on how to use computer-based programs or systems.						X		
18	Designing systems, equipment and components for application in the field of telecommunications.	X					X		
19	Working with activities involving satisfying customer requirements, enquiries and complaints.				X			X	
20	Leading others towards greater levels of efficiency and productivity.							X	
21	Managing others on operational level towards greater levels of efficiency and productivity.	X						X	
22	Receiving and distributing work activities on a daily basis.	X						X	
23	Overseeing the work of others to ensure compliance with organisational and client specifications.	X						X	
24	Working with quality assurance checklists in order to identify areas of noncompliance and determining corrective action.	X							
25	Developing an organisation by conducting market analysis and suggesting new direction and/or processes and/or activities.			X					
26	Being involved in process re-engineering to ensure up-to-date and/or more streamlined processes and procedures.	X						X	
27	Identifying suppliers of machinery, raw materials and services and buying items which are used or processed by the organisation.					X			
28	Working in a purchasing environment by assessing the market for suppliers who offers best value in terms of products and/or services.					X			
29	Examines and vouches for the accuracy and completeness of bookkeeping records and the financial statements of a business establishment.					X			

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
30	Identifies, evaluates and handles risks in a financial environment of a business establishment.			X					
31	Acts as financial advisor when, for instance, new bookkeeping systems and computers are introduced.					X			
32	Advising the business establishment and individuals on aspects concerning taxation, legal matters and finances.					X			
33	Working with top management officials to plan human resource policies that will meet the needs of the employer and employees.				X				
34	Keeps and evaluates confidential records of employees.		X						
35	Recruiting, selecting, tests, appoints and places staff in suitable posts within the business establishment.			X	X				
36	Controls processes and activities and modifies policy to meet particular objectives.	X						X	
37	Developing others towards reaching their full capacity within the business establishment.	X						X	
38	Mentoring and coaching others by analysing their areas for development, guiding them towards reaching personal goals and objectives.	X						X	
39	Analyse and evaluate financial information and effectively communicate the results to senior management towards making good business decisions.					X			
40	Sorting and distributing mail to areas and staff within the business enterprise, and dispatch outgoing mail.		X						
41	Answer telephone enquiries from customers and attend to visitors.				X				
42	Operate a range of office machines such as photocopiers, computers and facsimile machines.		X						
43	Handle orders and check and store incoming goods.		X			X			

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
44	File papers and documents so that they can be easily found when needed.		X						
45	Write business letters, reports or office memoranda using word-processing equipment.	X						X	
46	Undertake duties such as banking, credit control or payroll functions.					X			
47	Make travel and accommodation arrangements.				X				
48	Site surveying which includes preparing measured drawings of existing installations and collecting practical information relating to the project at hand.					X			
49	The preparation of working drawings for an installation contractor.								X
50	Supervising installation and/or construction processes and activities to ensure that work is progressing as it should.	X							X
51	Working in the field of business and corporate law.			X					
52	Working in the field of company taxation.					X			
53	Compute, classify and verify numerical data in order to develop and maintain financial records.					X			
54	Record debits and credits, compare current and past balance sheets, summarise details of separate ledgers and prepare financial reports.					X			
55	Running complex machines that add, subtract, multiply, divide and find the square root of numbers.	X							
56	Using calculators to prepare payrolls, compute production costs and related statistical operations.					X			
57	Plan, direct and organise the work of a department or business establishment.	X		X					
58	Taking responsibility for the effective running of a business or department.	X		X				X	

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
59	Deciding how goals can best be achieved and taking decisions regarding the resources needed (money, people, and equipment).	X							
60	Being part of top management (board of directors, chairman, and managing director).			X					
61	Being part of functional management (administrative, production, financial, marketing, purchasing).	X							
62	Being part of operational management (sales and marketing, advertising, credit, cost control).	X							
63	Responsible for compliance of regulations and policies by the business establishment.			X					
64	Setting and monitoring strategic and business plans for the business establishment.	X		X					
65	Involved in the marketing of the business establishment, its products and/or services.			X					
66	Providing information, advice or sells products and services to customers by telephone.				X				
67	Providing information, advice or sells products and services to customers in person (face-to-fific customer contact).				X				
68	Advises customers about choice of products and encourages them to buy.				X				
69	Negotiating deals and arranging purchase terms with customers.	X			X				
70	Examining the financial information of individual and corporate clients and suggesting better ways to protect investments.					X			
71	Advising the business establishment on costs, performance levels and budget.			X		X			

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
72	Works with business customers to understand their requirements and translating these into technical terms so that a solution can be designed.			X	X				
73	Responsible for the equipment used to link networks through the telecommunications system.						X		
74	Designs and installs equipment.	X							X
75	Detecting and correcting faults in telecommunications and electronic systems.	X					X		X
76	Responsible for the installation, testing and maintenance of wiring, accessories, control equipment, wire ways and switchboards.	X							X
77	Coordinating telecommunication system installation projects from the time they are initiated until they are completed.						X		X
78	Analysing figures with the aim to produce forecasts in respect of the profitability of new products, processes and expansions.					X			
79	Working in a credit control environment being responsible for opening and monitoring monthly payment of accounts.					X			
80	Having the authority to accept or reject credit applications in a business establishment.					X			
81	Giving emergency care to sick or injured persons.					X			
82	Involved in the development of electronic components, subsystems and systems.	X				X			X
83	Involved in the practical installation, maintenance and operation of electronic equipment.	X					X		X
84	The installation, maintenance and fault detection of equipment such as optic cables, cellular phones and satellite communication systems.	X							X

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
85	Plans, sets up and organises events such as conferences/exhibitions for promotional and/or marketing purposes.	X			X				
86	Managing facilities by keeping buildings and their services running effectively and maintaining a safe and efficient work environment.	X							
87	Managing the process of serving food to a large number of people.				X				
88	Setting supplier relationships and ordering and storing food in a restaurant environment.			X	X	X			
89	Responsible for the establishing, maintenance and decoration of corporate gardens.	X							X
90	Cleaning areas for planting, plough or digging beds, planting and watering seedlings in beds, pulling out weeds, pruning, mowing of lawns, cutting edges.	X							X
91	Creating the original design work and final artwork used for newspaper and magazine advertisements, pamphlets, posters, catalogues, brochures.			X					
92	Designing book covers, calendars, letterheads and labels.			X					
93	Prepare and conduct training programmes for employees of a business establishment.	X			X				
94	Selecting training aids such as textbooks or manuals, demonstration models and visual aids, and schedule training sessions.			X					
95	Conducts specialised training sessions, on-the-job training and apprenticeship programmes.	X			X				
96	Providing legal advice to the business establishment and its employees.				X				
97	Providing advisory services on legal aspects such as company law, taxation and personal advice.					X			

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
98	Involved in the scientific accumulation, analysis and interpretation of marketing information.			X					
99	Involved in the collecting, analysis and interpretation of data to determine the appeal of products and services.			X					
100	Studying the effectiveness of company advertising and advises management on sales and distribution policies.			X	X				
101	Promoting and selling products and services to other businesses, customers and institutions.			X	X				
102	Applying marketing techniques such as advertising, displays, market research and the identification of marketing opportunities.			X	X				
103	Planning, organises, manages, coordinates and controls production in a business establishment.			X					
104	Selecting new tools, machines and equipment as well as the most effective production processes and procedures for use in a telecommunications environment.	X					X		X
105	I would like to be involved in conducting, analysing, interpreting and reporting on psychological testing in the workplace environment.			X	X	X			
106	I would like to be involved in conducting, analysing, interpreting and reporting on workplace assessment related to individual performance levels.	X		X	X				
107	Providing counselling and guidance services to individuals on a one-on-one basis in the work environment.	X			X				
108	Using different forms of communication to establish efficient two-way interaction between a business establishment and other groups of people/ institutions/customers.	X			X				
109	Helping people and organisations to gain public acceptance by building and maintaining a favourable image.				X				

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
110	Providing information for newspaper items, magazine articles and news spots so that the public will be aware of the employer's projects and accomplishments.				X				
111	Greeting customers and visitors and direct them as to where they have to go.				X				
112	Organising and monitoring sales and marketing and distribution strategies.	X		X					
113	Supervising sales staff and the development of sales programmes designed to introduce prospective customers to new products and services.	X		X	X				
114	Reviewing market trends and evaluating sales and propose changes to the sales and marketing strategy of a business establishment.			X					
115	Developing a network of dealers who sell a product and/or service in the field.			X		X			
116	Introduces the public to the products and services of the business establishment and tries to create an interest which leads to the placement of order for products/services.		X	X					
117	Keeping an employer's office running smoothly and efficiently and performs routine tasks so that the employer can attend to more demanding issues.		X						
118	Being a security officer by protecting life and property, control access at the premises of a business establishment.		X						
119	Being trained in the use of weapons, armed response, retail security, security electronics and access control.	X	X						
120	Responsible for the maintenance and repair of underground and aerial telecommunication lines, mechanical aids, power installations and satellite earth stations.	X							X

Item No	Item	Activity driven	Administrative Services	Business Careers	Customer Support	Financial Numerical	Information Technology	People Oriented	Scientific Orientation
121	Operating a switchboard in order to relay incoming and inter-office calls to the correct parties, transfer calls and ensure connections for outgoing calls on a daily basis.		X						
122	Using computers with word processing programmes to type letters, articles or documents.	X							
123	Provide advice on organisational and work procedures in order to raise efficiency.								
124	Classifying work and develops means of measuring productivity and suggests incentive schemes.				X	X			
125	Likes repairing and mending things, enjoys using hands.	X							

APPENDIX B: I-PIA-M Abilities Items

Item No.	Item	Abstract Reasoning	Business Acumen	Inspiring and Leading Others	Managing Others	Numerical Ability	Resilience	Technical Expertise	Verbal Ability
1	I am able to keep up to date technically and solve technical problems within the business establishment.							X	
2	I possess sufficient knowledge to perform effectively in own area of specialty.							X	
3	I possess sufficient knowledge to provide technical advice to others in the business establishment.		X						
4	I am able to maintain a good balance between being practical and visionary, tough and compassionate, and being appropriately factual and intuitive.	X							
5	I am able to take responsibility for my actions, admit errors and take the necessary corrective action when and if required.				X				
6	I am able to deliver on my promises with the assumption that they were attainable and within my span of control.				X				
7	I am able to lead others towards greater performance and efficiency by applying situational leadership theory and practice.			X					
8	I can apply efficient and effective mechanisms to ensure a healthy work and personal life style.						X		
9	In general, my stress control mechanisms allow me to recover with ease should I experience stress on regular intervals.						X		
10	I believe I have sufficient self-control capacity when handling problems within my work and personal environment.				X				
11	I am able to work with others in a constructive manner towards reaching a common goal and/or objective.				X				
12	I am able to assemble facts, consider alternatives, and balance competing considerations before reaching the most appropriate solution(s).					X			

Item No.	Item	Abstract Reasoning	Business Acumen	Inspiring and Leading Others	Managing Others	Numerical Ability	Resilience	Technical Expertise	Verbal Ability
13	I am able to make decisions to improve the way I perform my tasks.				X				
14	I deal effectively with pressure and emotions of other individuals.						X		
15	I live a healthy lifestyle, i.e. I am fit and able to balance work and personal issues effectively.						X		
16	I cope well with stress, i.e. I am able to remain objective and calm in spite of difficult situations.						X		
17	I find it easy to see the relationship between parts; to `complete' the picture; to envisage the whole or end-result; to anticipate the outcome.	X							
18	I find it easy to work with numbers and figures.					X			
19	I find it easy to work and deal with numbers and figures of advanced complexity.					X			
20	I find it easy to adapt and accept change; opposing views; new ideas			X					
21	In a spirit of co-operation and collaboration, I find it easy to negotiate an amicable outcome which includes all party's concerns on a win-win basis.				X				
22	I find it easy to listen and understand what has been spoken clearly and objectively.								X
23	I view myself as being verbally expressive, inspiring, manipulative, convincing, talkative, spontaneous, open-minded								X
24	I view myself as being courteous, diplomatic, comforting, respectful when attending to the problems or difficulties people experience.			X					
25	I am able to collect, process, analyse and integrate into a relevant, factual outcome or conclusion.					X			
26	I find it easy to evaluate and judge situations or alternative strategies, actions and outcomes against rational, logical assumptions.	X							

Item No.	Item	Abstract Reasoning	Business Acumen	Inspiring and Leading Others	Managing Others	Numerical Ability	Resilience	Technical Expertise	Verbal Ability
27	I find it easy to convey information by means of written instructions in an accurate, concrete, clear, concise and understandable manner.								X
28	I find it easy to build common ownership of commitment to group goals, shared (team) vision, decision-making, problem-solving and management.				X				
29	I find it easy to utilise `big picture understanding' in a practical and proactive manner to plan appropriate courses of action in realising strategic goals.	X							
30	I have a good command of English and communicate effectively with all people at all levels within the organisation.								X
31	I find it easy, through communication, to generate co-operative effort from team members and external customers and role players to promote business objectives.								X
32	I am competent in all areas of project management, i.e. drawing up plans, identifying work to be done and managing the implementation of the project.				X				
33	I actively exploit business opportunities to the advantage of the employer.		X						
34	I have an understanding of basic business principles and applying these in my company's context.		X						
35	I am able to develop, implement and control a budget effectively.					X			
36	I find it easy to support the effective development and implementation of organisational/ department strategy, goals and objectives.	X							
37	I find it easy to manage resources (time, money, and people) optimally in order to support business strategic objectives, processes and activities.				X				

349

Item No.	Item	Abstract Reasoning	Business Acumen	Inspiring and Leading Others	Managing Others	Numerical Ability	Resilience	Technical Expertise	Verbal Ability
38	I find it easy to influence and motivate people towards high levels of performance and efficiency.			X					
39	I find it easy to develop relationships with team members, which results in high performance and harmonious interactions.			X	X				
40	I find it easy to organise and prioritise work in an effective and efficient manner.				X				
41	I find it easy to convey information by means of written instructions in an accurate, concrete, clear, concise and understandable manner.								X

APPENDIX C: Initial Item Loadings of the I-PIA-M: Rotated Factor loadings (Career Interest Subscale)

Initial Factor Method: Principal Components										
Factor Pattern										
		Factor 1 Information Technology and Scientific orientation	Factor 2 Financial/ numerical	Factor 3 Business careers	Factor 4 People oriented	Factor 5 Administrative service	Factor 6 Customer support	Factor 7 Environment driven	Factor 8 Activity driven	Factor 9 Environment driven: Legal l
Variance explained	Description of item	16.13	14.47	13.53	7.32	7.28	5.05	3.90	3.55	2.84
A83	Involved in the practical installation, maintenance and operation of electronic equipment.	0.87								
A84	The installation, maintenance and fault detection of equipment such as optic cables, cellular phones and satellite communication systems.	0.86								
A75	Detecting and correcting faults in telecommunications and electronic systems.	0.86								
A74	Designs and installs equipment.	0.84								
A76	Responsible for the installation, testing and maintenance of wiring, accessories, control equipment, wire ways and switchboards.	0.84								
A10	I like to work with my hands in executing maintenance activities related to electronic equipment.	0.83								
A82	Involved in the development of electronic components, subsystems and systems.	0.82								
A12	I would love to install electronic equipment related to the telecommunications industry.	0.81								
A15	I would like to be involved in the practical installation, maintenance	0.80								

	and operation of electronic equipment.									
A77	Coordinating telecommunication system installation projects from the time they are initiated until they are completed.	0.80								
A9	I like to work with my hands in building and/or constructing electronic equipment.	0.78								
A120	Responsible for the maintenance and repair of underground and aerial telecommunication lines, mechanical aids, power installations and satellite earth stations.	0.73								
A73	Responsible for the equipment used to link networks through the telecommunications system.	0.72								
A18	Designing systems, equipment and components for application in the field of telecommunications.	0.71								
A104	Selecting new tools, machines and equipment as well as the most effective production processes and procedures for use in a telecommunications environment.	0.69								
A16	My preference is to develop a software (computer program) product.	0.67								
A11	Driving and/or handling machinery and equipment appeals to me.	0.67								
A49	The preparation of working drawings for an installation contractor.	0.61								
A125	Likes repairing and mending things, enjoys using hands.	0.57								
A50	Supervising installation and/or construction processes and activities to ensure that work is progressing as it should.	0.50								
A54	Record debits and credits, compare current and past balance sheets, summarise details of separate		0.85							

	ledgers and prepare financial reports.								
A31	Acts as financial advisor when, for instance, new bookkeeping systems and computers are introduced.		0.83						
A53	Compute, classify and verify numerical data in order to develop and maintain financial records.		0.83						
A29	Examines and vouches for the accuracy and completeness of bookkeeping records and the financial statements of a business establishment.		0.82						
A32	Advising the business establishment and individuals on aspects concerning taxation, legal matters and finances.		0.79						
A30	Identifies, evaluates and handles risks in a financial environment of a business establishment.		0.78						
A13	I would like to calculate wages and employee benefits in a finance department.		0.77						
A79	Working in a credit control environment being responsible for opening and monitoring monthly payment of accounts.		0.76						
A39	Analyse and evaluate financial information and effectively communicate the results to senior management towards making good business decisions.		0.76						
A14	Working with organisational budgets always appeal to me.		0.75						
A52	Working in the field of company taxation.		0.75						
A56	Using calculators to prepare payrolls, compute production costs and related statistical operations.		0.74						
A46	Undertake duties such as banking, credit control or payroll functions.		0.72						

A71	Advising the business establishment on costs, performance levels and budget.		0.68							
A70	Examining the financial information of individual and corporate clients and suggesting better ways to protect investments.		0.65							
A78	Analysing figures with the aim to produce forecasts in respect of the profitability of new products, processes and expansions.		0.64							
A80	Having the authority to accept or reject credit applications in a business establishment.		0.63							
A3	Working and controlling figures has always been a keen interest of mine.		0.60							
A55	Running complex machines that add, subtract, multiply, divide and find the square root of numbers.		0.59							
A4	Working and controlling budgets has always been a keen interest of mine.		0.59							
A101	Promoting and selling products and services to other businesses, customers and institutions.			0.85						
A114	Reviewing market trends and evaluating sales and propose changes to the sales and marketing strategy of a business establishment.			0.84						
A112	Organising and monitoring sales and marketing and distribution strategies.			0.82						
A102	Applying marketing techniques such as advertising, displays, market research and the identification of marketing opportunities.			0.81						
A113	Supervising sales staff and the development of sales programmes designed to introduce prospective customers to new products and services.			0.78						

A100	Studying the effectiveness of company advertising and advises management on sales and distribution policies.			0.78						
A116	Introduces the public to the products and services of the business establishment and tries to create an interest which leads to the placement of order for products/services.			0.77						
A65	Involved in the marketing of the business establishment, its products and/or services.			0.77						
A68	Advises customers about choice of products and encourages them to buy.			0.75						
A69	Negotiating deals and arranging purchase terms with customers.			0.74						
A115	Developing a network of dealers who sell a product and/or service in the field.			0.73						
A67	Providing information, advice or sells products and services to customers in person (face-to-face customer contact).			0.72						
A66	Providing information, advice or sells products and services to customers by telephone.			0.63						
A62	Being part of operational management (sales and marketing, advertising, credit, cost control).			0.57						
A99	Involved in the collecting, analysis and interpretation of data to determine the appeal of products and services.			0.55						
A98	Involved in the scientific accumulation, analysis and interpretation of marketing information.			0.54						
A103	Planning, organises, manages, coordinates and controls production in a business establishment.			0.53						

Code	Description								
A28	Working in a purchasing environment by assessing the market for suppliers who offers best value in terms of products and/or services.				0.50				
A58	Taking responsibility for the effective running of a business or department.					0.75			
A21	Managing others on operational level towards greater levels of efficiency and productivity.					0.71			
A20	Leading others towards greater levels of efficiency and productivity.					0.69			
A59	Deciding how goals can best be achieved and taking decisions regarding the resources needed (money, people, and equipment).					0.67			
A60	Being part of top management (board of directors, chairman, and managing director).					0.59			
A57	Plan, direct and organise the work of a department or business establishment.					0.58			
A6	I always perceive myself as someone who has the ability to influence and persuade others.					0.56			
A2	I am a results driven person and wish to influence my own progress towards predefined goals.					0.54			
A24	Working with quality assurance checklists in order to identify areas of noncompliance and determining corrective action.					0.52			
A25	Developing an organisation by conducting market analysis and suggesting new direction and/or processes and/or activities.					0.52			
A41	Answer telephone enquiries from customers and attend to visitors.						0.83		
A44	File papers and documents so that they can be easily found when needed.						0.77		

A40	Sorting and distributing mail to areas and staff within the business enterprise, and dispatch outgoing mail.					0.71				
A42	Operate a range of office machines such as photocopiers, computers and facsimile machines.					0.67				
A43	Handle orders and check and store incoming goods.					0.65				
A45	Write business letters, reports or office memoranda using word-processing equipment.					0.59				
A47	Make travel and accommodation arrangements.					0.58				
A111	Greeting customers and visitors and direct them as to where they have to go.					0.58				
A121	Operating a switchboard in order to relay incoming and inter-office calls to the correct parties, transfer calls and ensure connections for outgoing calls on a daily basis.					0.57				
A117	Keeping an employer's office running smoothly and efficiently and performs routine tasks so that the employer can attend to more demanding issues.					0.53				
A122	Using computers with word processing programmes to type letters, articles or documents.					0.51				
A105	I would like to be involved in conducting, analysing, interpreting and reporting on psychological testing in the workplace environment.						0.84			
A106	I would like to be involved in conducting, analysing, interpreting and reporting on workplace assessment related to individual performance levels.						0.83			
A107	Providing counselling and guidance services to individuals on a one-on-one basis in the work environment.						0.82			

357

A108	Using different forms of communication to establish efficient two-way interaction between a business establishment and other groups of people/ institutions/customers.						0.65			
A109	Helping people and organisations to gain public acceptance by building and maintaining a favourable image.						0.56			
A35	Recruiting, selecting, tests, appoints and places staff in suitable posts within the business establishment.							0.81		
A36	Controls processes and activities and modifies policy to meet particular objectives.							0.66		
A38	Mentoring and coaching others by analysing their areas for development, guiding them towards reaching personal goals and objectives.							0.60		
A33	Working with top management officials to plan human resource policies that will meet the needs of the employer and employees							0.60		
A37	Developing others towards reaching their full capacity within the business establishment.							0.58		
A34	Keeps and evaluates confidential records of employees.							0.58		
A94	Selecting training aids such as textbooks or manuals, demonstration models and visual aids, and schedule training sessions.								0.75	
A93	Prepare and conduct training programmes for employees of a business establishment.								0.73	
A95	Conducts specialised training sessions, on-the-job training and apprenticeship programmes.								0.72	

A97	Providing advisory services on legal aspects such as company law, taxation and personal advice.								0.65
A96	Providing legal advice to the business establishment and its employees.								0.63
A51	Working in the field of business and corporate law.								0.59

APPENDIX D: Initial Item Loadings of the I-PIA-M: Rotated Factor loadings (Ability Subscale)

Initial Factor Method: Principal Components							
Factor Pattern (Ability Profile)							
		Factor 1 Abstract reasoning and Verbal ability	Factor 2 Managing others	Factor 3 Business acumen	Factor 4 Resilience	Factor 5 Numerical ability	Factor 6 Technical ability
Variance explained		17.23	3.09	3.00	2.66	2.21	2.01
Variable	Description of item						
B22	I find it easy to listen and understand what has been spoken clearly and objectively.	0.92					
B24	I view myself as being courteous, diplomatic, comforting, respectful when attending to the problems or difficulties people experience.	0.90					
B13	I am able to make decisions to improve the way I perform my tasks.	0.90					
B40	I find it easy to organise and prioritise work in an effective and efficient manner.	0.87					
B25	I am able to collect, process, analyse and integrate into a relevant, factual outcome or conclusion.	0.87					
B12	I am able to assemble facts, consider alternatives, and balance competing considerations before reaching the most appropriate solution(s).	0.87					
B27	I find it easy to convey information by means of written instructions in an accurate, concrete, clear, concise and understandable manner.	0.86					
B41	I find it easy to convey information by means of written instructions in an accurate, concrete, clear, concise and understandable manner.	0.85					

360

B21	In a spirit of co-operation and collaboration, I find it easy to negotiate an amicable outcome which includes all party's concerns on a win-win basis.	0.85					
B26	I find it easy to evaluate and judge situations or alternative strategies, actions and outcomes against rational, logical assumptions.	0.85					
B20	I find it easy to adapt and accept change; opposing views; new ideas.	0.84					
B28	I find it easy to build common ownership of commitment to group goals, shared (team) vision, decision-making, problem-solving and management.	0.84					
B14	I deal effectively with pressure and emotions of other individuals.	0.84					
B39	I find it easy to develop relationships with team members, which results in high performance and harmonious interactions.	0.82					
B30	I have a good command of English and communicate effectively with all people at all levels within the organisation.	0.82					
B29	I find it easy to utilise `big picture understanding' in a practical and proactive manner to plan appropriate courses of action in realising strategic goals.	0.81					
B16	I cope well with stress, i.e. I am able to remain objective and calm in spite of difficult situations.	0.80					
B17	I find it easy to see the relationship between parts; to `complete' the picture; to envisage the whole or end-result; to anticipate the outcome.	0.80					

B15	I live a healthy lifestyle, i.e. I am fit and able to balance work and personal issues effectively.	0.80					
B31	I find it easy, through communication, to generate co-operative effort from team members and external customers and role players to promote business objectives.	0.79					
B38	I find it easy to influence and motivate people towards high levels of performance and efficiency.	0.78					
B23	I view myself as being verbally expressive, inspiring, manipulative, convincing, talkative, spontaneous, open-minded	0.77					
B37	I find it easy to manage resources (time, money, and people) optimally in order to support business strategic objectives, processes and activities.	0.68					
B36	I find it easy to support the effective development and implementation of organisational/ department strategy, goals and objectives.	0.67					
B6	I am able to deliver on my promises with the assumption that they were attainable and within my span of control.		0.81				
B5	I am able to take responsibility for my actions, admit errors and take the necessary corrective action when and if required.		0.77				
B2	I possess sufficient knowledge to perform effectively in own area of specialty.		0.64				
B7	I am able to lead others towards greater performance and efficiency by applying situational leadership theory and practice.		0.63				

362

B4	I am able to maintain a good balance between being practical and visionary, tough and compassionate, and being appropriately factual and intuitive.		0.53				
B32	I am competent in all areas of project management, i.e. drawing up plans, identifying work to be done and managing the implementation of the project.			0.77			
B33	I actively exploit business opportunities to the advantage of the employer.			0.73			
B34	I have an understanding of basic business principles and applying these in my company's context.			0.61			
B35	I am able to develop, implement and control a budget effectively.			0.57			
B9	In general, my stress control mechanisms allow me to recover with ease should I experience stress on regular intervals.				0.78		
B10	I believe I have sufficient self-control capacity when handling problems within my work and personal environment.				0.70		
B8	I can apply efficient and effective mechanisms to ensure a healthy work and personal life style.				0.67		
B11	I am able to work with others in a constructive manner towards reaching a common goal and/or objective.				0.63		
B35	I am able to develop, implement and control a budget effectively.					0.49	
B19	I find it easy to work and deal with numbers and figures of advanced complexity.					0.93	

363

B18	I find it easy to work with numbers and figures.					0.89	
B2	I possess sufficient knowledge to perform effectively in own area of specialty.						0.46
B1	I am able to keep up to date technically and solve technical problems within the business establishment.						0.87
B3	I possess sufficient knowledge to provide technical advice to others in the business establishment.						0.82