THE RELATIONSHIP BETWEEN GENERATIONAL COHORTS, POSITIVE COPING AND RETENTION FACTORS AMONGST ENGINEERS

by

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SUPERVISOR:
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DECLARATION

Name: Samantha Samuel
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Degree: Master of Commerce in Business Management
Title: The Relationship Between Generational Cohorts, Positive Coping And Retention Factors Amongst Engineers

I Samantha Samuel, (student number 40649253), declare that this thesis entitled, **The Relationship Between Generational Cohorts, Positive Coping And Retention Factors Amongst Engineers** is my own and original work, and that all the sources that I have used or quoted have been listed and acknowledged in the bibliography.

Additionally, I declare that ethical clearance to conduct the research was obtained from the Department of Human Resource Management, University of South Africa. I took great care in ensuring that I adhered to the ethical obligations and principles of research ethics as prescribed by the UNISA Code of Ethics and Conduct, during all phases of the research process.

……..……

Samantha Samuel 24 April 2022

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I shall be eternally grateful to God for my excellent health and well-being. For it is only by God's grace that all things are possible.

I would not be where I am now if it had not been for the sacrifices made by my late parents, Jayalutchmi and Parmagethum Samuel. Their conviction in the value of academic performance have shaped me into who I am today.

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ABSTRACT / SUMMARY

The Relationship Between Generational Cohorts, Positive Coping and Retention Factors Amongst Engineers

By

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SUPERVISOR: Prof N Ferreira
DEPARTMENT: Department of Human Resource Management
DEGREE: Master of Commerce in Business Management

This research focuses on the relationship between generational cohorts, positive coping and retention factors and to determine whether individuals differ significantly in terms of their demagogical variables (gender, race, age, job level and qualification level), generational cohorts, positive coping and retention factors amongst engineers. A random sample of full-time employed engineers working in South Africa was used in a quantitative research approach. A demographic questionnaire, the Positive Coping Behaviour Inventory (PCBI), and the Retention Factor Measurement Scale (RFMS) measuring instruments were used to gather information. The sample consisted of 89.4% males and only 10.6% were female engineers employed within the engineering sector in South Africa. The generational cohort with a birth year ranging from 1961 to 1980, with Generation X making up the majority of the sample (47.7%). Correlation analysis indicated a relationship between generational cohorts, positive coping and retention factors and inferential statistics reveled significant difference between the demagogical variables (gender, race, age, job level and qualification level), positive coping and retention factors. A hierarchical regression analysis revealed that affective positive (emotion-focused) coping significantly predict satisfaction with retention factors. Recommendations were made to human resource practitioners to implement innovative positive coping mechanisms that will guide retention strategies within the engineering sector in South Africa.

KEY TERMS

Generational cohorts, positive coping, engineers, retention and retention factors

OPSOMMING

Die multi-generasie arbeidsmag en die implikasies daarvan vir die positiewe hanterings- en retensiefaktore onder ingenieurs

deur

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Hierdie navorsing het die verhouding tussen generasionele kohorte, positiewe hantering en retensiefaktore ondersoek, asook om vas te stel of generasionele kohorte en positiewe hantering retensie onder ingenieurs betekenisvol kan voorspel. ’n Kwantitatiewe navorsingsbenadering is gevolg onder ingenieurs wat voltyds in diens is (*N* = 151). Die steekproef het bestaan uit (89.4%) mans en (10.6%) vroue wat in die ingenieursektor in Suid-Afrika werksaam was. Die generasionele kohort, met ’n geboortejaar wat strek van 1961 tot 1980, het drie generasies ingesluit, met Generasie X wat die meerderheid van die steekproef beslaan het, naamlik 47.7%. Korrelasie-analises het ’n verwantskap tussen generasionele kohort en positiewe hantering en retensiefaktore aangedui, en inferensiële statistiek het ’n aantal betekenisvolle verskille tussen die demografiese veranderlikes (gender, ras, ouderdom, posvlak en kwalifikasievlak) aangedui. Resultate van ’n stapsgewyse regressie-analise het onthul dat affektiewe postiewe hantering tevredenheid met retensiefaktore betekenisvol voorspel. Aanbevelings is aan menslike hulpbronpraktisyns gemaak om innoverende positiewe hanteringsmeganismes te implementeer wat retensiestrategieë binne die ingenieursektor in Suid-Afrika sal lei.

SLEUTELTERME

Generasionele kohorte, positiewe hantering, ingenieurs, retensie en retensiefaktore

OKUCASHUNIWE/ UKUFINGQA

Abasebenzi abakhiwe ngabantu abavela ezizukulwaneni eziningana kanye nemithelela yabo yokubhekana nesimo esihle kanye nezici zokugcinwa phakathi konjiniyela

ngu

Samantha Samuel

UMPHATHI:	USolwazi N Ferreira
UMNYANGO:	UMNYANGO WEZOKUPHATHWA KWABASEBENZI
IZIQU:	Iziqu ezithuthukisiwe emkhakheni Webhizinisi Lokuphathwa ezigxile kwezezimali nezomnotho

Lolu cwaningo luphenye ubudlelwano phakathi kwabantu abazalwe ngesikhathi esifanayo, ukubhekana nesimo esihle kanye nezici zokugcinwa, kanye nokuthola ukuthi ingabe abantu abazalwe ngesikhathi esifanayo kanye nokubhekana nesimo esihle kanye nezici zokugcinwa kubikezela ngokuphawulekayo ukugcinwa phakathi konjiniyela. Indlela yocwaningo yokuqoqa nokuhlaziya imininingwane yezinombololo yenziwa phakathi konjiniyela abaqashwe ngokugcwele (N = 151). Isampula yayihlanganisa (89.4%) abesilisa kanye (10.6%) nabesifazane ababeqashwe emkhakheni wobunjiniyela eNingizimu Afrika. Abantu abazalwe ngesikhathi esifanayo, abanonyaka wokuzalwa osukela ku-1961 kuya ku-1980, lifake izizukulwane ezintathu, nabazalwe ekuqaleni kwawo-1960 kuya ku-1980 lenza iningi lamasampula ku-47.7%. Ukuhlaziywa kokuhlobana kubonise ubudlelwano phakathi kwabantu abazalwe ngesikhathi esifanayo kanye nezici ezinhle zokubhekana nezimo nokugcinwa, futhi indlela yokwenza imibono mayelana nezibalo zabantu ngokusekelwe kumasampuli yembula umehluko omkhulu phakathi kokuhlukahluka kwezibalo zabantu (ubulili, uhlanga, ubudala, izinga lomsebenzi nezinga lokuzuziwe emfundweni). Imiphumela yokuhlaziya yokwakha isifanekiso ngokwengeza noma ukususa okuguquguqukayo kokubikezela iveze ukuthi ukubhekana nokuhle okuthintayo kubikezela ngokuphawulekayo ukwaneliseka ngezici zokugcinwa. Kwenziwa izincomo kubasebenzi ukuze basebenzise izindlela ezintsha zokubhekana nesimo ezizoqondisa amasu okugcinwa emkhakheni wobunjiniyela eNingizimu Afrika.

Amagama asemqoka (Generational cohorts), Abantu abazalwe ngesikhathi esifanayo (positive coping), ukubhekana nesimo esihle (engineers), onjiniyela (retention), ukugcinwa (retention factors)

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CHAPTER 1: SCIENTIFIC OVERVIEW OF THE RESEARCH

1.1 INTRODUCTION

This research focuses on the relationship between generational cohorts, positive coping and retention factors and to determine whether individuals differ significantly in terms of their demographical variables (gender, race, age, job level and qualification level), generational cohorts, positive coping and retention factors amongst engineers. While South Africa trains many engineers, who are recognised internationally for the quality of their training, there appears to be a considerable movement of professionals between engineering companies in the country. According to Blersch et al. (2020), many South African engineering companies would like to retain the services of their professionally qualified employees to ensure continuity and buildup of institutional memory in terms of their operational requirements. However, intergenerational clashes can arise due to different life skills that influence people's ability to work with others, both above and below their levels, which can result in worker dissatisfaction and resignations. The background and motivation for the desired research are presented in this chapter, which led to the formation of the problem statement and research questions. The goal and objectives are presented, followed by a chapter outline.

1.2 BACKGROUND AND MOTIVATION FOR THE RESEARCH

Engineering is a broad profession that spans across a wide range of applications and industries, according to the Engineering Council of South Africa (n.d.). The four primary engineering categories are civil, chemical, mechanical, and electrical engineering. However, as the world becomes more technologically advanced, new engineering professions will emerge. Graduates with a recognised or certified academic qualification, such as a Bachelor of Science in Engineering, Bachelor of Engineering, or a National Diploma/Bachelor of Technology in Engineering, can apply to the Engineering Council of South Africa for professional registration as a candidate engineer. It is important to keep in mind that not all the engineering disciplines are required to register with ECSA (Engineering Council of South Africa, 2014).

The Engineering Council of South Africa (ECSA) regulates the engineering profession in South Africa on behalf of the South African government. ECSA not only accredits engineering programs, registers professionals, and regulates their activity, but it also assists the government in investigating the extent and reach of the engineering profession, as well as measures to enhance skill development (Engineering Council of South Africa, 2014).

Engineers play a vital role as they offer innovative solutions that include societal demands, sustainability, and environmental preservation by combining mathematics, engineering science, and technology. Both economic activity and national development rely heavily on engineering expertise (Engineering Council of South Africa, n.d.).

The South African Government has indicated that engineering is a 'priority skill' and the development and retention of engineers has been highlighted as critical to ensure the development of vital infrastructure (Reddy et al., 2018). A key constraint of the engineering sector in South Africa is the shortage of engineers, engineering technicians and artisans (Reddy et al., 2018), with effective employee retention practices needing to play a prominent role in managing employee turnover. Engineering talents, according to Reddy et al. (2018), are amongst the list of top 10 scarce skills worldwide, including in South Africa. Engineers were selected as a priority employment that fell under the key skills list. In a technical study published by DNA Economics (2020) identified engineers as a priority occupation in South Africa that still fell on the critical skills list as they are in high demand and strategically important to meet the goals of the 2030 South African National Development Plan. According to latest 2020/2021 critical skills survey conducted by Xpatweb (n.d.) engineers still fall into the top ten skills business struggle to recruit. According to Watermeyer and Phillips (2020), a scarcity of professionally qualified engineers hinders economic progress and employment creation. The engineering sector in South Africa is well positioned to contribute to economic growth, and the requirement for competent engineering personnel has grown increasingly important to the country's future economic success (Watermeyer & Phillips, 2020). As a result, human resource strategies have become increasingly important as many South African companies are working hard to adopt new strategic human resource solutions that will allow them to retain professionally trained (Uitzinger et al., 2018) engineers, as they strive for long-term viability in an intensely competitive, ever-changing, and uncertain environment (Coetzee et al., 2014).

The greatest asset of any consulting engineering company would be its workforce. The longer employees are employed, the more experience they gain and the more valuable they become to the business, who in turn are able to train others in their operation practices (Papa et al., 2018). Business leaders need to invest in strategic employee retention schemes, to assist employees in making a conscious decision to staying within an organisation for a longer period (Kashyap & Verma, 2018).

Räthzel et al. (2018) contend that the landscape of employment is changing, as organisations work with increasing levels of change in the workforce. Makhubela and Ngoepe (2018)

advocate that despite operating in a very turbulent economy, organisations should be innovative in holding on to their valuable employees, as many top performers give a business a competitive advantage. Abate et al. (2018) maintain that many organisations depend on their multi-generational workforce for sustainability and progression, and that not adjusting their culture can lead to high employee turnover.

A cohort represents a cluster of people who have jointly experienced an event within the same period (Ryder, 1966). Graf et al. (2021) contend that a birth cohort defines who they are, as they share developmental experiences. A cohort, according to Zwanka and Buff (2020), is a group of people who have a same interest. For example, learners in the same year of matriculation may be referred to as a 'matric cohort'. Klokgieters et al. (2021) found that younger birth cohorts are considerably more diverse than older generations.

In light of South Africa's social divisions, Jonck et al. (2017) believe it is critical to perform generation cohort research to see if social inequalities have decreased since the country's democratic transition in 1994 and the availability of jobs to people of all races. The Apartheid generation, born between 1938 and 1960, the Struggle generation, born between 1961 and 1980, the Transition generation, born between 1981 and 1993, and the Born-Free generation, born after 1994, are the four generations that make up the South African workforce. Generational cohort theory, according to Oyedemi (2021), is a cohort's style of thinking that is impacted by the moment in history into which they are born, since they will have similar mindsets and act in similar ways because they have shared experiences of major events.

Doyle (2017) maintains that older generations (Apartheid and Struggle generation) in South Africa are forced to work alongside younger generations due to insufficient personal financial planning. According to research, older, more experienced employees can boost a company's production and employment chances. By contributing their years of knowledge and skill in a consulting or assisting capacity, older generations can build a savings account and increase their income (Sanlam, 2021). Furthermore, younger generations (Transitional and Born Free generation) in South Africa are less conscious of apartheid scars left behind on their parents and grandparents. They do not see the past as a problem as they are well educated, more opinionated and very technologically well informed. With the rapid advancement of technology, younger generations are more efficient (Chekalin, 2021) as computer-aided engineering design and drafting software applications have replaced the traditional manual calculations and hand-drawn engineering designs.

Smith and Garriety (2020) postulate that while younger generations bring valuable insight to an organisation, which is essential for their success, they are poor communicators and have limited interpersonal skills. These differences can result in conflict arising in the workplace as managers are older with greater experience and place more importance on social skills such as verbal and non-verbal communication, time management, strategic planning, adaptability, teamwork and people skills which the younger generations lack (Smith & Garriety, 2020). This generational clash can lead to management's failure to comprehend the differences between multi-generational employees and the influence it has on employee retention.

According to Heyns and Kerr (2018), generational differences are unavoidable, however they can lead to issues that end in conflict, necessitating company leaders to develop novel solutions to aid in positive coping mechanisms and staff retention techniques. Daugherty (2021) argued that by understanding a multi-generational workforce, managers can identify positive coping motivators that could be implemented to retain their valuable talent. Jones (2017) points out that promoting a friendly working environment can inspire innovation and collaboration amongst generational cohorts, which could have a beneficial impact on employee retention. Ferry (2018) believes that all employees are wired with an embedded engaging coping trait that assists in reducing stress levels through feelings of happiness and engagement in the workplace.

While employees are generally left to manage with their own work-related stress, it is important that employers understand that the problems their staff experience should be cause for concern. To ensure economic survival in a very turbulent economy, many organisations, regardless of their size, must adjust to increasing challenging circumstances and cope with aggressive competitors (Bertoldi, 2021). The increased work pressure put on engineers has also affected their well-being, indicating the need to equip then with positive coping resources in the workplace (Marais et al., 2017). As a result, scholars have explored how people handle stress and cope when they are faced with difficult challenges and organisational changes (Li et al., 2021).

Management and leadership training allow managers to improve on their management style regarding the way they manage generational cohorts, delegate tasks and receive feedback. Bibi et al. (2018) contend that training and development policies should reinforce an employee’s self-confidence and ensure that they have a solid understanding of their job attributes and responsibilities.

According to Hur (2018), Hertzberg's two-factor theory of motivation has two dimensions and has a direct impact on employee retention. One dimension helps the retention of engineers by lowering dissatisfaction factors, such as working hours and conditions, supervision, relationships, company policy, administration and remuneration, and the other dimension is to increase an engineer's retention by promotions, achievement, responsibility and recognition. In light of this understanding, many organisations are exploring effective human resource practices that will allow them to hold on to their qualified engineers, stay competitive and develop their footprint in a very turbulent uncertain business environment (Hussein et al., 2021).

This research will therefore investigate the possible relationship between generational cohorts, positive coping and retention factors, and determine whether this can significantly predict retention amongst engineers in South Africa. The findings of the research could possibly be useful in helping managers and human resource practitioners implement innovative positive coping mechanisms that will guide retention strategies.

1.3 PROBLEM STATEMENT

According to Blersch et al. (2020), engineers can be classified as knowledge workers since their expertise is focused on the person rather than the company. Since its engineers hold an engineering firm's intellectual capital, retention of knowledge workers is critical for reducing data loss (Jayasingam et al., 2016). Despite the fact that most companies have had difficulty employing engineers, Consulting Engineers South Africa (CESA) found that there has been substantial engineer mobility across all generational cohorts in recent years (CESA, 2021). As a result, there is a continual need to train engineers to understand the specific job requirements and the long-term business engineering culture that can be passed down to future generations of engineers (Blersch et al., 2020).

Therefore, this research is aimed at investigating a relationship between generational cohorts, positive coping and retention factors amongst engineers. It is clearly seen from the theoretical background discussed that understanding generational cohorts and positive coping could lead to discovery of improved employee retention practices within the engineering sector. Ultimately, the empirical findings may provide suggestions for the field of employee retention within the engineering sector in South Africa and to make an innovative and unique addition to the current body of knowledge.

A review of the current literature on generational cohorts, positive coping and retention factors amongst engineers gives rise to the following research problems:

- Theoretical models do not explain the relationship between generational cohorts, positive coping and retention amongst engineers.
- Engineering companies need to understand the theoretical and empirical relationship between generational cohorts, positive coping and retention factors.
- There is a need to examine the dynamics between generational cohorts, positive coping and retention factors as well as the implications of this relationship on retention practices.
- The concept of generational cohorts and positive coping is not widely researched in South Africa, hence there seems to be a lack of research in terms of how these variables relate to retention factors. This research is therefore new and original in its contribution to the field of retention of valuable staff.

Engineering companies and human resource management will benefit greatly from research on the relationship between generational cohorts, positive coping, and retention factors, particularly in terms of employee retention practices aimed at enhancing employee retention in a more turbulent labor market. Finally, the findings might be applied to other industries to help with employee retention in South Africa. Based on the aforementioned, the following research topics were presented for the literature review and methodological analysis:

1.3.1 Research questions regarding the literature review

Research Question 1: How are generational cohorts, positive coping and retention factors conceptualised and explained by theoretical models in literature?

Research Question 2: Does a theoretical relationship exist between the different generational cohorts, positive coping and retention factors and how can this relationship be explained?

Sub-question 2.1: What is the theoretical relationship between the different generational cohorts and positive coping?

Sub-question 2.2: What is the theoretical relationship between the different generational cohorts and retention factors?

Sub-question 2.3: What is the theoretical relationship between positive coping and retention factors?

Research question 3: Do demographical variables (gender, race, age, job level and qualification level) influence the theoretical relationship between generational cohorts, positive coping and retention factors?

1.3.2 Research questions regarding the empirical study

Research Question 1: What is the statistical association between generational cohorts, positive coping and retention factors in a sample of engineers employed in South Africa and what are the implications of the statistical associations for employee retention practices?

Research Question 2: What are the differences that exist among individuals in terms of their demographical variables (gender, race, age, job level and qualification level), generational cohorts, positive coping and retention factors in the sample of engineers employed in South Africa?

Research Question 3: What recommendations can be formulated for engineering companies regarding the use of generational cohorts, positive coping and retention factors in the development of employee retention practices and future research?

1.4 AIMS OF THE RESEARCH

Given the empirical research questions as discussed above, the following aims of the study are formulated:

1.4.1 General aim of the research

The aim of the research is to explore the relationship between generational cohorts, positive coping and retention factors within a sample engineers employed in the engineering sector in South Africa and to establish any association with gender race, age, job and qualifications levels.

The research will be to establish a relationship between generational cohorts, positive coping and retention factors, and will also establish the influence genders, race, age, job and qualification levels have on generational cohorts, positive coping and retention factors.

1.4.2 Specific aims of the research

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

1.4.2.1 Literature review

In terms of the literature review the specific objectives are:

Research aim 1: To conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature.

Research aim 2: To identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs.

Sub-aim 2.1: To conceptualise the relationship between generational cohorts and positive coping attributes from a theoretical perspective.

Sub-aim 2.2: To conceptualise the relationship between generational cohorts and employee retention from a theoretical perspective.

Sub-aim 2.3: To conceptualise the relationship between positive coping and employee retention from a theoretical perspective.

Research aim 3: To conceptualise the influence of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

1.4.2.2 Empirical study

In terms of the empirical study, the specific aims are as follows:

Research Question 1: To conduct an empirical investigation into the statistical association between generational cohorts, positive coping and retention factors.

Research Question 2: To empirically investigate the influence of demographical variables (gender, race, age, job and qualification level) on generational cohorts, positive coping and retention factors.

Research question 3: To formulate recommendations for engineering companies regarding the use of generational cohorts, positive coping and retention factors for employee retention practices.

1.4.3 Hypotheses

This study will attempt to prove that: a relationship exists between generational cohorts, positive coping and retention factors, and that they therefore display varying levels of retention factors. This hypothesis also assumes that employees from different genders, race, age, job and qualification levels will display different levels of generational cohorts, positive coping and retention factors.

The landscape of the research generated the following hypotheses statements:

H1	There is a significant and positive relationship between generational cohorts, positive coping and retention factors.
H2	Differences exist among generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels).

1.5 POTENTIAL VALUE ADD

Understanding generational cohorts and positive coping could lead to improved employee retention practices within the engineering sector in South Africa and to make an innovative and unique addition to the current body of knowledge.

Research on the relationship between generational cohorts, positive coping and retention factors will make an important contribution towards engineering companies and human resource management, mainly regarding employee retention practices aimed at enhancing employee retention in a more turbulent labour market.

The drive of the research was to identify a relationship between generational cohorts, positive coping and retention factors in the engineering sector in South Africa to suggest recommendations for employee retention practices.

This research is that foundation in shaping a possible relationship between generational cohorts, positive coping and retention factors. If significant relationships are found, they could

refine employee retention practices and improve the retention of talented engineers in South Africa.

1.5.1 Potential value add on a theoretical level

At a *theoretical level*, should a relationship between generational cohorts and positive coping (independent variables) and retention factors (dependent variable) be established, then they will be able to provide insight for employee retention practices within the South African engineering sector.

1.5.2 Potential value add on an empirical level

At an *empirical level*, the research might provide insight into understanding the relationship and the differences between the generational cohorts, and their positive coping and retention factors within the engineering sector in South Africa. If no relationship between the variables are detected, then the usefulness of this research will be limited to the elimination of generational cohorts and positive coping as a predictor of employee retention. Researchers should then focus their efforts that may give useful data for addressing the problem of how to improve talent retention techniques in South African engineering firms.

1.5.3 Potential value add on a practical level

At a *practical level,* the findings will enable human resource practitioners to understand the constructs of generational cohorts and positive coping, which may favorably or adversely affect employee retention strategies, and thereby influence the contents of the retention policies and practices. Positive findings from this study may increase awareness of the fact that people differ in terms of generational cohorts, positive coping and retention variables, and that these constructs may impact a company's retention methods and how each generation deals with positive coping and employee retention.

1.6 RESEARCH DESIGN

This study entailed an exploratory descriptive research design, using a questionnaire survey of engineers registered with the Engineering Council of South Africa (ECSA) to collect quantitive data. According to Rhein (2020), quantitative research is a confidential methodical strategy to uncover relationships, verify ideas, and measure difficulties. Zheng (2020) contends that the research design is a logical blueprint of how a study should be conducted.

Sileyew (2020), noted that a research design is a logical strategy that connects research questions to actual study execution, while Zheng (2020) believes that it entails a technique to answering the research questions.

The relationship between the various variables (generational cohorts, positive coping and retention factors) was investigated using a quantitative analysis approach. The study presented quantitative assessments of generational cohorts, positive coping, and retention factors, as well as evidence of how different demographical variables, such as gender, race, age, job, and qualification level, affect these variables.

The generational cohorts were measured using a self-designed demographical questionnaire, positive coping used a Positive Coping Behavioural Inventory (PCBI), the short Version of which was developed by Coetzee and Potgieter (2019), and Retention Factor Measurement Scale (RFMS) used was developed by Döckel (2003). The Engineering Council of South Africa (ECSA) and DRA global, sent out a survey link to all engineers requesting their participation in completing an on-line questionnaire. The research technique used to analyse the data was descriptive, followed by correlation analysis to identify potential relationships between the variables.

1.6.1 Exploratory research

The primary goal of exploratory research was to discover new ideas, conduct preliminary studies, and set research priorities for the future (Dudovskiy, 2018). Exploratory research, according to Vedel and Kokshagina (2021), is used to undertake studies into unknown themes, with a survey utilised to ensure that the optimal study design, data collecting techniques, and respondents are chosen. Udu et al. (2018) also feel that secondary research is employed to review the existing literature and data.

Because it investigated multiple theoretical perspectives on generational cohorts, positive coping, and retention factors, the approach used in this study was exploratory.

1.6.2 Descriptive Research

Descriptive research defines a social setting, a relationship, an opinion, attitude, or behaviour held by a group of employees on a given subject. Creswell and Creswell (2018) suggested that the main aim of descriptive research is to give a snapshot of the situation as it happens. According to Wong (2020) descriptive research describes the situation being studied and it is

one of the best methods for gathering information, as it describes the world as it exists. In the literature review, a descriptive approach was used to conceptualise the three constructs of generational cohorts, positive coping and retention factors. In the empirical study, descriptive research was used, whereby means, standard deviations and internal consistency in terms of the construct's generational cohorts, positive coping and retention factors was used.

1.6.3 Explanatory Research

Yousaf (2021) confirms that the motivation for doing exploratory research is to improve on previous limited studies. This approach attempts to link ideas to understand the cause and effect of a situation and enables the researcher to explain what was happening. George (2021) advocates that explanatory research increases an understanding of why things happen rather than simply showing the existence of a relationship between variables. The goal of this study was to look at the type, direction, and amplitude of the relationships between the variables rather than showing cause-and-effect linkages. Spearman correlations were used to determine the relationship between the variables of generational cohorts, positive coping, and retention factors. To evaluate if gender, race, age, employment level, and qualification level differed significantly in terms of the characteristics studied, independent sample t-tests were used.

1.6.4 Research variables

The research was conducted in the context of employee retention in South Africa. Its goal was to assess the relationship between two independent variables (generational cohort and positive coping) and one dependent variable (retention factors). The goal of the study was to see if there was a statistically significant empirical relationship between these factors and if demographic characteristics such gender, race, age, employment, and qualification levels changed.

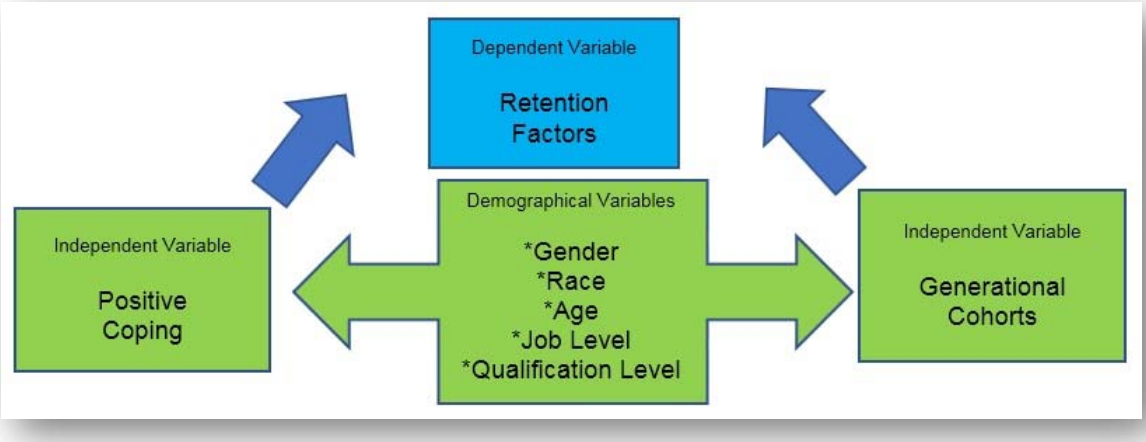
This research was interested in:

- Establishing the relationship between generational cohorts (independent variable) and retention factors (dependent variable)
- Establishing the relationship between positive coping (independent variable) and retention factors (dependent variable)

Figure 1.1 indicates the theoretical relationship between the independent variables and the dependent variables.

Figure 1.1

The Theoretical Relationship Between the Variables



Source: Author's own compilation

1.6.5 Methods used to ensure validity and reliability

1.6.5.1 Validity

According to Sileyew (2019), the major goal of a research design is to understand the relationship between the independent and dependent variables, and only when the research design achieves this goal is it considered legitimate. Riffe et al. (2019) refer to the study producing true and valid findings as the constructs being measured in a valid way. For research to be internally valid, the constructs were measured in using a valid method, with the data therefore being correct and reliable.

Internal validity was assured in this research by using the following methods:

- The most recent literature was used, although certain traditional sources were also consulted since they were relevant to our study. Theories and models that were relevant to this research topic, problem statement and research aims was also used.
- The measuring instruments used were presented in a standardised manner and were regarded as being valid and reliable.

According to Rubin and Babbie (2014), to ensure external validity, the researcher must select a representative sample from the population that can be generalised to other groups. The empirical study's design validity was assured by employing consistent measurement tools.

1.6.5.2 Reliability

Shuttleworth (2015) populates that reliability assesses the quality of the measurements and is only considered reliable if consistent results are achieved every time that it is applied. According to Sideridis et al. (2018), reliability refers to a measurement instrument's consistency and dependability. Drost (2011) goes on to say that the researcher can assess the reliability of the literature by using current literature sources, theories, and models. Except for the classic literature, which cannot be replaced, all the literature included in this research is current.

To guarantee reliability in the analysis of the results, a representative sample and a statistical tool (SPSS) was utilised to analyse the data obtained. The dependability of the research design was assured by reducing the challenging variables through meticulous research planning. The literature review reliability was based on the availability of the sources to other parties who are interested, as this ensures the trustworthiness of evaluation. To ensure the accuracy and reliability of the data, current sources were used. The empirical study's trustworthiness is assured by using a representative sample of the population, and all the instruments utilised had been tested and proven to be reliable in prior research.

1.6.6 Unit of analysis

According to Dhir (2019), there are four types of analytical units: social artefacts, organisations, groups, and people. Engineers as a group served as the unit of analysis in this study. According to Saunders et al. (2019), data analysis is the ability to evaluate data, explain the nature of components, and identify connections between concepts that affect the individuals from whom the researcher collects data. The goal of the study was to determine how two independent variables (generational cohorts and positive coping) interacted with one dependent variable (retention factors). Variables are qualities that fluctuate between groups and have changing values in specific situations (Dhir, 2019). The information gathered was utilised to evaluate the relationship between the independent factors (generational cohorts and positive coping) and the dependent variable (retention factors).

1.6.7 Delimitations

The scope of this study was limited to the relationship between three constructs: generational cohorts, good coping, and retention factors. With the aim of investigating the factors that may influence the generational cohorts, positive coping, and retention factors, and the demographic

variables were limited to just include gender, race, age, job level, and qualification level. The aim of this research was restricted to research on the relationship between three constructs generational cohorts, positive coping and retention factors. The selected research method allowed the researcher to investigate if a relationship between these three constructs does exist. If there is a relationship, then it would be useful to other academics working on areas related to these three constructs of generational cohorts, positive coping, and employee retention factors.

1.6.8 Ethical considerations

Research ethics is defined by Saunders et al. (2019) as the appropriateness of the researcher's behavior in relation to the rights of the respondents or the rights of the parties influenced by the research project. Saunders et al. (2019) found that participants' ethical rights include participation, privacy, anonymity and confidentiality. Additionally, Saunders et al. (2019) also refer to ethical considerations being made to keeping all company's information, private and anonymous at all times. All data gathered from the participants was strictly used to achieve the research objectives.

The ethical guidelines, code of conduct and professional standards, as specified by the University of South Africa formed the basis of this research and were adhered to. The following processes were taken to guarantee that the researcher obeyed all ethical requirements:

- The research parameters were established, and the research was carried out within those parameters.
- When researching and explaining topics, both traditional and modern resources were used.
- As a method of ensuring a scientific study process, experts in the subject were consulted and cited.
- All sources were cited, references were double-checked and Turnitin was used to check for plagiarism.
- Participation in the research was on a totally voluntary basis and no one was forced into participating in the research.
- Participants could withdraw from the study, at any point in the process, without offering an explanation.
- By completing the survey participants provided their informed consent.
- No monetary incentives were used to promote participation in the research.

- Participants who were interested in the research findings were encouraged to contact the researcher after the research was concluded.
- All data collected and analysed, as well as the results, were managed discreetly and confidentially in accordance with Creswell and Clark (2011) and Yin (2016).
- To ensure confidentiality, the participants remained anonymous and were not required to reveal any personal details that may compromise their identity.
- To allow for reliable data collection, the research process and findings were documented in the form of a thesis.
- Assuring that there was no misreporting or manipulation of data or research findings.

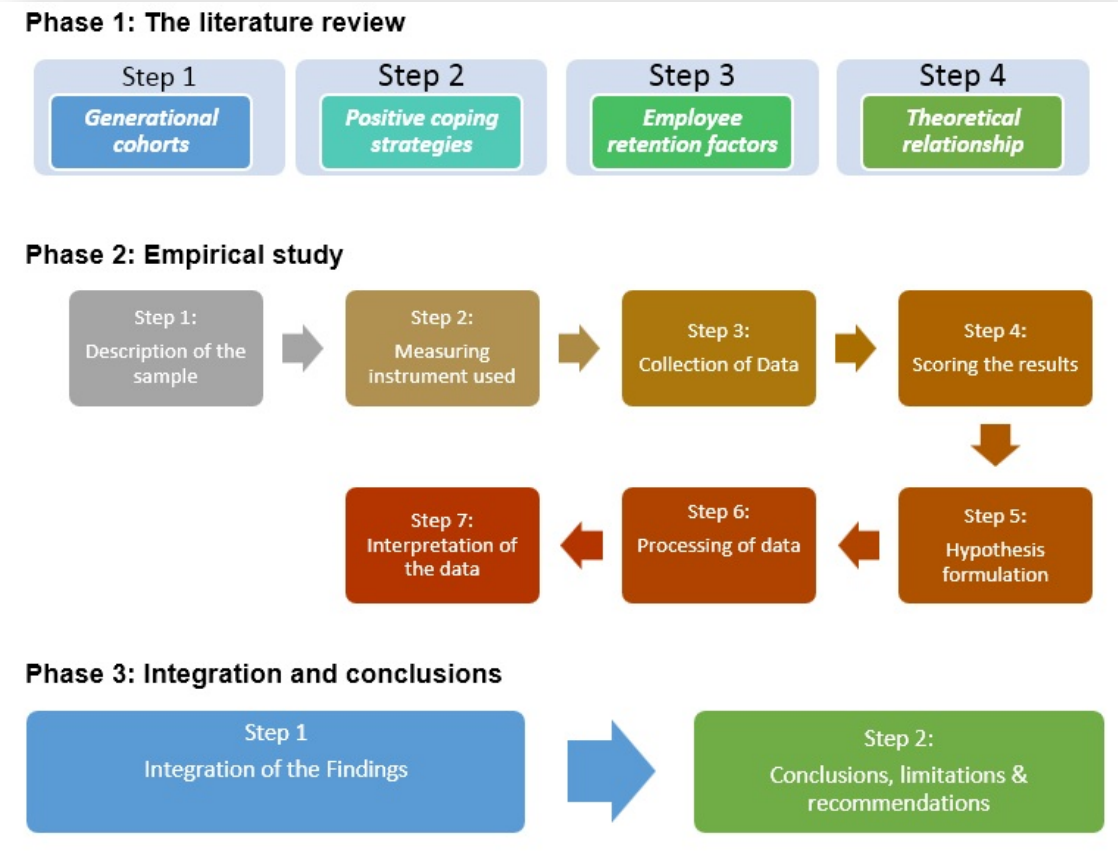
For this research, there researcher firstly obtained ethical approval from the University of South Africa (UNISA) to conduct the research. Permission to collect the data was obtained from both the Consulting Engineers South Africa (ECSA) and DRA Global to access their database of registered engineers. In a covering letter, engineers were assured of their confidentiality and anonymity. Engineers were also assured that participation in the research was on a purely voluntary, anonymous basis. By completing the research, engineers gave the researcher full consent to uses their responses only for research purposes.

1.7 RESEARCH METHODOLOGY

There were three phases to this study: (1) literature review (2) empirical study and (3) integration and conclusions. Figure 1.2 depicts the research methodology and the actions that were taken during the research process to guarantee that the study was carried out methodically.

Figure 1.2

Overview of the Research Methodology



Source: Author's own work

Phase 1: The literature review

The literature review consisted of a review of generational cohorts, positive coping, retention factors, their theoretical integration and theoretical relationship between them. *This will be discussed in Chapter 3.*

The steps that were followed in this stage are:

Step 1: A generational cohort was conceptualised from a theoretical perspective.

Step 2: Conceptualise positive coping from a theoretical perspective.

Step 3: Employee retention was conceptualised from a theoretical perspective.

Step 4: The theoretical relationship between generational cohorts, positive coping and employee retention as conceptualised.

Phase 2: The empirical study

The methodology for the *empirical study is presented in Chapter 4.* The study entailed inviting engineers registered with Engineering Council of South Africa and employed with DRA Global. To participate in an on-line questionnaire survey to address issues related to their generation, positive coping and retention. The following steps were undertaken:

Step 1: Determination and description of the sample

The unit of analysis was full time employed adults, employed in the engineering sector in South Africa. The inclusion of demographical variables like gender, race, age, job and qualification level were important to determine to what extent these factors influence the constructs. *Chapter 4 discusses the determination and description of the sample in more detail.*

Step 2: Choosing and motivating the psychometric battery

A self-designed demographical questionnaire comprising of data regarding gender, age, race, job level and educational level was used in addition to the research questionnaires. The instruments that were used are the Positive Coping Behavioural Inventory (PCBI) the short Version which is developed by Coetzee and Potgieter (2019) and the Retention Factor Measurement Scale (RFMS) developed by Döckel, (2003). These measuring instruments have all been tested in South Africa for reliability and validity. The psychometric properties of these scales are discussed in chapter 4.

Step 3: Administration of the psychometric battery

The following data collection procedure was followed:

- An online invitation was distributed to all potential participants, who were required to give consent before they could proceed with the questionnaires.
- A demographical questionnaire was distributed, to obtain demographical information on gender, race, age, job level and qualification level of the participants.
- A Positive Coping Behaviour Inventory (PCBI) and the retention factor measurement scale (RFMS) were also distributed to all the participants in the sample.
- The participants completed the questionnaires online using LimeSurvey.
- The privacy and confidentiality of all participants was ensured, and no harm was done to any participant in the research process.

- Ethical permission was obtained from the University of South Africa to conduct the research.

Chapter 4 discusses the administration of the psychometric batter in more detail.

Step 4: Scoring of the psychometric battery

All of the completed questionnaire responses were put into an electronic excel file. The IBM Statistical Package for the Social Sciences (SPSS) version 26 was used to analyse all of the data.

Step 5: Formulation of the research hypothesis.

The research hypotheses were formulated in order to determine an appropriate statistical analysis.

Step 6: Statistically analysing the data

Categorical or frequency data, particularly standard deviations and means, were the statistical procedures relevant to this research. The validity and reliability of the instruments were assessed using descriptive statistics. The direction and strength of the relationships between the demographical variables and the three constructs were determined using correlation statistics, specifically the Spearman Correlations coefficient. ANOVA and independent sample t-tests were also utilised.

Step 7: Reporting and interpreting the results

Tables, diagrams, and figures were used to present the findings, which are discussed in a methodical manner, ensuring that their interpretation is conveyed in an understandable manner. *This is covered in detail in Chapter 5.*

Phase 3: Integration and conclusions

Step 1: Integration of the research findings

The results of the literature review were combined with the results of the empirical investigation to produce the research's overall conclusions. *This is covered in detail in Chapter 5.*

Step 2: Formulation of conclusions, limitations and recommendations

The last step involves drawing conclusions based on the findings and integrating them with the theory. The research limitations were discussed, and suggestions for future research in a multi-generational workforce and its implications for positive coping and retention factors were suggested. *This is covered in detail in Chapter 6.*

1.8 CHAPTER LAYOUT

The design of the chapters was presented in the following method:

Chapter 1: Scientific overview of the research
Chapter 2: Meta-theoretical context of the study: retention factors of engineers in South Africa
Chapter 3: Generational cohorts, positive coping behaviour and retention factors
Chapter 4: Research method
Chapter 5: Research results
Chapter 6: Conclusions, limitations and recommendations

1.9 CHAPTER SUMMARY

The reason for the research, the problem statement, the objectives, the paradigm viewpoint, the research design, and the research approach were all described in this chapter. The motivation behind this study was to explore if relationships exist between generational cohorts, positive coping, and employee retention may assist engineering companies and HR professionals find, develop, and retain engineers.

Chapter 2 discusses the meta-theoretical context of a multi-generational workforce and the retention of engineers in South Africa.

CHAPTER 2: META-THEORETICAL CONTEXT OF THE STUDY: MULTI-GENERATIONAL WORKFORCE AND RETENTION OF ENGINEERS IN SOUTH AFRICA

KEYWORDS:
Generations, multi-generational, engineers, retention

2.1 INTRODUCTION

The South African engineering sector, according to Reddy et al. (2018), has experienced significant setbacks in recent years as a result of engineering being identified as a scarce skill. As a result, engineering firms are deeply invested in extending the careers of older generations so that vital information may be handed down to younger generations (Samuel et al., 2019). Understanding generational differences has become critical for organisations, as it leads to improved organisational performance, enhanced productivity, and the retention of highly qualified engineers (Shikweni et al., 2019).

2.2 GENERATIONAL WORKFORCE

A generation is defined as a group of people born during a specified range of time that share developmental stages, formative life experiences, economic conditions and important political circumstances (Becton et al., 2014). Depending on the country or community people of the same age are born into, they face similar problems and are impacted by the same trends and world events. It is through life experiences, parenting styles, exposure to music, clothes, sports, communication technologies and the increasing interconnectedness of the world that a generation develops a common outlook of the world (Ralph, 2019). Recollections of historical life changing events and lifestyle play an essential role in influencing a generation shared value system, their attitude and behaviour. From one generation to another there are differences in the way each generation reacts to authority, management styles, teamwork, innovation and technology (Parry & Urwin, 2017). Parry and Urwin (2017) are also of the opinion that a shared mix of characteristics can define people from the same generational cohort.

2.2.1 Generational workforce in South Africa

According to Statistics South Africa there are 38,3 million people of working age in South Africa, with a working age population of 15 – 64 years old (Statistics South Africa, 2019). Looking at the current employment landscape in South Africa, it is evident that the world of

work has undergone a radical change, with the South African labour market having to cope with the new reality of five generations working side by side with each other (Ng & Parry, 2016).

In South Africa's twenty-five years of democracy, Baby Boomers, Generation X, and Generation Y, sometimes known as Millennials, have dominated the workforce. In recent research conducted by Momentum Corporate in 2019 Millennials made up 52% of the South African workforce (Portrag, 2019) as a result, Millennials will start becoming a dominate generation, as older generations start retiring and Generation Z gets themselves entrenched into the workforce. Generation Z brings a new dynamic into the generational mix because this generation has been raised in a very high-tech and hyper-connected era (Jenkins, 2019).

With the current world of work existing in a technology-driven age, there are now infinite options to change the way we live and even the way we work. Wilkinson (2019) is of the mindset that with robotics, algorithms and automation, artificial intelligence has the ability drastically improve productivity and economic growth. This outlook poses a very real threat to the local South African workforce as humans are being replaced by smart robots that can perform complex assembling operations (Krasadakis, 2018).

Leaders must accept new methods of working when dealing with a multigenerational staff. According to Harrell (2016), 60 percent of new jobs require skills that only 20% of the workforce has, so taking a learning approach that allows employees to learn and upskill on the job is not only a by-product of the future of work, but also something leaders should consider as they build out their workforce strategies alongside HR to ensure they retain top talent.

2.2.2 Generational challenges

The world of work has altered considerably in South Africa, with the South African labor market now having to deal with the new reality of five generations coexisting (Ng & Parry, 2016). Heyns and Kerr (2018) are of the opinion that in the pursuit of retaining a multi-generational workforce, organisational leadership should carefully examine the needs, values and priorities of different generations. Colette and Stein (2014) found that it is essential for managers to identify the fundamentals that keep employees motivated to promote commitment and increase retention within a multi-generational workforce. Haynes (2011) found that workforce demographics has become a serious concern for management as there are more distinct differences between generations that influence their attitudes and performance at work (Burke et al., 2015). Furthermore, younger generations in South Africa are oblivious to the apartheid scars left behind on their parents and grandparents (Jonck et al., 2017). Younger generations

are more diverse in terms of their gender, race, attitude, values and beliefs. Younger generations do not see the past as a problem because they are more educated, more opinionated and more technologically skilled than older generations (Van Rossem, 2019).

In general, there are three major human resource management challenges facing the multi-generational workforce working in the engineering sector in South Africa. Firstly, engineering companies are heavily invested in extending the careers of older engineers, as they are committed to ensuring vital knowledge transfer from older engineers to younger engineers (Samuel et al., 2019). Secondly, younger engineers do not follow a traditional career path; instead, they want a modern career with adaptability to different options. Additionally, younger engineers measure career achievement in terms of career satisfaction and work/life balance, rather than the number of promotions and compensation (Ehrhart et al., 2012). Thirdly, there is a distinct difference in work values, expectations, work ethics and attitudes, which inevitably leads to generational conflict in the workplace. Younger generation's find the leadership styles of older generations to be outdated, while older generations find younger generations to be impatient and disrespectful to organisational structures and hierarchy. As younger generations begin to step into leadership roles, it is vital for them to understand the dynamics of collaborating with an aging workforce in order to eliminate workplace conflict (Gursoy et al., 2013).

2.2.3 Ageing workforce

An ageing workforce leaves an organisation with a talent shortage, as they will retire and need to be replaced, making it important to plan around replacing the older generations with a younger generation (Shikweni et al., 2019). While the transfer of vital skills from one generation to another can be challenging (Tarique & Schuler, 2012), an organisation must invest in talent management interventions (Ng & Parry, 2016) to ensure their longevity.

2.2.4 Technological advancement

Karr (2021) found that each generation has its own distinct way of how they use, adapt and integrate new technology into their lives. Codica (2021) found that in 2020 the Covid-19 pandemic brought about a new way of working during the forced a global lockdown, as a result telecommuting become the new normal, which allowed employees to be connected to the organisation, from any location and at any time. New technology as enabled remote working and allowed employees to virtually connect to their colleagues in an instant. Organisations are now forced into implementing new age working strategies like telecommuting and flexitime

which enables employees to balance their work demands and maintain a stable work and family life balance (Peek, 2020). Heathfield (2021) supports the view and is of the opinion that flexibility is important as it increases the employee's commitment, loyalty, morale, it reduces turnover and improves the employee's longevity in the organisation.

With the rapid advancement of technology, employees can be more efficient and face the reality of being replaced due to non-performance (Chekalin, 2021). This is evident within the engineering sector as computer-aided design and drafting software applications like AutoCAD (a technical drawing package), have replace the old hand-drawn designs. The younger engineers have a natural computer aptitude and are very efficient at producing good quality design drawings, more-so than the older engineers, who often that take longer to produce the same design drawings. Whitehouse (2020) argues that with the advancement of technology, surveillance software is able to track how many hours are spent on completing a task, with some employees and their careers now being affected by changes of organisational systems and procedures.

Unfortunately, the South African engineering sector is not ready to embrace the fourth industrial revolution as the industry has failed to invest in technology and to train engineers, artisans and technicians to meet the challenge of building new infrastructure, while at the same time upgrading existing services to keep up with increased socio-economic demands of a rising population and rapid urbanisation (Nyatsumba, 2017). Due to the competitive nature of the engineering industry and with rapid technological advancement, organisations are now forced to downsize their workforce and move away from a hierarchy management style to adopting a flatter organisational structure (Quain, 2019). Additionally, older generations are now forced to delay their retirement and join younger generations within the South African workforce (Doyl, 2017). According to Pelta (2019) older generations are negative and it is difficult to keep them motivated and engaged to allow the transfer of vital skills, information and expertise to younger generations.

Deloitte (2019) Global Millennial survey reported that younger generations bring valuable insight and technological advancement to an organisation, which is vital for the organisation's success. However, Pelta (2019) believes that younger generations are poor communicators and have bad relationship building skills. It is therefore not surprising that conflict arises in the workplace, as managers are older generations, being experienced and placing great importance on communication and soft skills, which the younger generations lack, as they rely on technology and not on interactions with people (Pelta, 2019). This generational clash leads to the general business problem that organisations are faced with in South Africa, where

management does not notice the differences among generational cohorts and the influence it has on employee retention.

2.3 RETAINING ENGINEERS

The Engineering Council of South Africa (ECSA) is a legal entity founded under the Engineering Profession Act 46 of 2000. (EPA). The ECSA's primary responsibility is to ensure that the engineering profession is governed in conformity with the Act. This entails the registration and control of the professional behavior of competent engineering practitioners. In South Africa engineers are categorised according to their educational qualifications, experience and their accreditation with the Engineering Council of South African (ECSA). Engineers are categorised as professional engineers, professional engineering technologists, professional certificated engineer, professional engineering technician, candidate engineering technician, candidate certificate engineer, candidate engineering technologist, candidate engineer and graduate.

There are little more than 16 900 registered professional engineers in South Africa (ECSA, 2021). South Africa lags below other emerging countries in terms of average population per engineer, according to an international standard. In South Africa, one engineer serves 3 166 people, compared to 227 in Brazil and 543 in Malaysia (Payi, 2021).The Engineering Council of South Africa (ECSA) claims that the world benchmark of engineers per population reveals that South Africa lags behind other developing countries (Payi, 2021).Consulting Engineers South Africa (CESA) also believes that the engineering sector is constrained by the shortage of a skilled engineers (Smith, 2020) as they are either leaving the industry to join other sectors or emigrating to other countries (Pather, 2019). Shikweni et al. (2019) is also of the mindset that the output of graduating engineers is insufficient, and the industry has also failed in attract and retain valuable engineering talent.

The scarcity of engineers threatens the engineering sector's viability for projects such as energy generation, purification systems, transportation, and urban development, among others (Shikweni et al., 2019), forcing companies to employ talent management techniques such as poaching and recruiting. Additionally, it is evident that the supply of engineers is not meeting the current demand, that engineering companies need to be resourceful in meeting the short to medium-term needs of the industry (Shikweni et al., 2019). Furthermore, engineering companies in South Africa are faced with many other challenges such as mentoring and coaching younger engineers, restructuring, addressing the challenges of an ageing workforce and the decreasing employment opportunities on a national level. Naidoo et

al. (2019) found that organisations need to understand the continually changing organisation dynamics in order to improve organisational effectiveness, increase productivity and retain valuable talented engineers.

2.3.1 Retaining a generational workforce

According to Maheswari and Krishnan (2014), retention refers to a company's ability to keep the people it wants, and highly valued employees should be encouraged to stay as long as feasible or until a project is completed. Employee retention, according to Jones (2017), is defined as the strategies and processes employed by organisations to keep competent people from leaving and joining rivals. According to Baruch (2013), employee retention should be limited to high-performing employees who make a major contribution to the company's success.

Gursoy et al. (2013) argued that by understanding a workforce that crosses generations, managers can identify motivators that could be implemented to retain their valuable talent. Cloutier et al. (2015) believe that differences that exist amongst generations could lead to challenges for business leaders as they strive for innovative strategies that could assist in employee retention strategies. Meriac et al. (2010) maintain that it is inevitable that differences exist between generations, which sometimes leads to misinterpretations and conflict. Seipert and Baghurst (2014) are also of a similar mindset and suggest that employee retention concerns are related to multi-generational differences. Latkovikj et al. (2016) confirm that work ethics and values are pivotal, as it justifies opinions and behaviour of the different generations.

Bennett et al. (2012) found that it is of vital importance to understand how to manage differences amongst multi-generational employees, as it will lead the organisation to growth and success. Nelsey and Brownie (2012) believe that leaders of multi-generational organisations are inclined to behave towards all employees the same way, regardless of their cohort classification. Instead, a multi-generational workforce should be treated according to their needs. Jones (2017) points out that by promoting a friendly working environment it can inspire innovation and collaboration amongst generational cohorts, which could have a beneficial impact on employee retention. Carpenter and Charon (2014) supports this view and is of the opinion that many organisations depend on a multi-generational workforce for advancement, however they do not change their culture in relation to a multi-generational workforce and these organisations are faced with high staff turnover and exceptionally low employee retention rates.

Zemke et al. (2013) maintain that managers need to understand how to manage differences among multi-generational employees which can decrease generational conflict and increase employee retention, as it is important to the organisation's success. Bennett et al. (2012) also contend that it is valuable to combat differences among multi-generational employees, as it is vital to the organisation's success. Research also suggests that establishing a diverse and friendly workplace environment can inspire collaboration and cooperation between generational engineering cohorts, which could lead to increased productivity and long-term employee commitment (Jones, 2017).

Singh (2013) posits those challenges found in the fast-paced working environment makes an impact on employee retention, therefore organisations should develop sound employee retention policies to ensure the retention of their employees. According to Lore (2017) employers must develop several employee retention policies: (1) work schedule flexibility, (2) health and wellness, which has a big influence on shaping an employee's overall lifestyle, (3) recognition and rewards policy, whereby excellence is recognised and rewarded and top performers are given more responsibility which entrenches them in the organisation, (4) personal development policy, which encourages a culture of personal growth, (5) a compensation plan that is balanced with benefits entrenches the employee and increases the employee's drive to deliver outstanding results. (6) work-Life balance policy, whereby flexible working hours empowers employees to be more productive. Rise (2021) further maintains that supplementary factors like childcare, additional annual leave days per annum, subsidised lunch allowance or gym memberships are a few retention factors that drive a long-term commitment from employees.

Managing employee diversity requires a wealth of skill and knowledge, therefore it is paramount that Business leaders guide their efforts in gaining insight into the challenges of managing and retaining an age-diverse workforce. Once insight into working with a multi-generation workforce has been acquired, effective strategies can be implemented to improve motivation, increased productivity and retention of a multigenerational workforce.

2.3.2 The importance of retaining engineers

Madonsela (2020) found that the South African engineering sector is well positioned to contribute to economic growth and the need for qualified engineering professionals has become increasingly vital to the future success of the South African economy. Smith (2020) and BusinessTech (2021) support this view and found that a key constraint of the engineering sector in South Africa is the shortage of engineers, engineering technicians and artisans. In

the pursuit of retaining professionally qualified employees human resource practices have become progressively significant as many South African engineering companies are striving for sustainability in an extremely competitive, ever evolving and uncertain environment (Keller, 2019).

Statistics South Africa released the economic growth data for 2020 which indicated the economy has slipped into another recession (Stats SA, 2020). Due to the slowdown of the economy, due in part of the restrictions imposed by governments due to the COVID-19 pandemic, engineering companies were forced to downsize their workforce. Another major challenge is high employee turnover, which leads to a decline in productivity, a lower employee morale, affects the relationship with clients and leads to the organisation losing more key employees (Jonck et al., 2017). Organisations, according to Hussein et al. (2021), will suffer operational and strategic consequences if they fail to retain their valued skilled personnel. When organisations invest in their valuable assets, such as time and money on training and developing employees, they must also focus on retaining their valuable talent (Vinikas, 2021). Reichenberg (2021) believes that organisations often lose their valuable skilful talent to their competitors and as a result, they lose their competitive edge.

Heathfield (2021) found that with telecommuting and virtual meetings, collaboration between teams had improved, which creates an information sharing environment which aids in the retention of skilled employees, as knowledgeable skilled employees cannot be easily replaced. According to research, replacing a talented employee costs twice as much as the individual's yearly package and in some cases, the company also loses credibility with its devoted clients, as well as expertise and the history of past and present initiatives (Merhar, 2021). Chakraborty (2020) also added that it is important for organisations to create information sharing environments like SharePoint Intranets that are designed to promote communication, enhance collaboration, employee engagement, boost productivity which leads to the retention of skilled employees. Heathfield (2021) supports the view that a flexible working schedule has become increasingly important and has a positive impact on work performance.

Half (2021) identified factors that contribute and encourage the retention of key employees working on challenging projects, such as recognising of capabilities, working in a learning environment, a well-balanced work/life balance, competitive compensation and good open communication with the organisation. Additionally, Half (2021) found that success and efficiency of an organisation rests on the retention of key employees.

The study therefore aimed to look at the relationships between generational cohorts, positive coping and retention factors in a sample of engineers employed in the South African engineering sector and to provide suggestions for retaining engineers. The success and survival of engineering companies operating in South Africa hinge on retaining their engineers. The need to deploy effective retention strategies that will retain an age-diverse workforce is vital to the viability of the engineering sector (Shikweni et al., 2019). The findings of this research may contribute to an enriched understanding of the changing and distinctive standards, preferences, attitudes, and views of a multigenerational workforce.

2.4 CHAPTER SUMMARY

There have been several developments in the engineering sector in South Africa in the recent past. Engineers used to be expected to work for a single business for the remainder of their life, but under the new paradigm, they are more likely to work for a variety of engineering firms over the course of their careers. As a result of this paradigm shift, engineering firms must adapt and find strategies to keep their best engineers on staff. Engineering organisations, according to Singh (2019), are establishing new retention trends as well as realising and embracing the significance of retention. Additionally, understanding how to handle age disparities among generational cohorts is critical for organisations, as it will lead to increased organisational effectiveness, increased productivity, and the retention of highly skilled engineers.

This chapter provided the basis for the research, with the overall meta-theoretical context of a multi-generational workforce and the retention of engineers in South Africa.

Chapter 3 will focus on research aim 1,2 and research aim 3 of the literature reviews:

Research aim 1: To conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature.

Research aim 2: To identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs.

Research aim 3: To conceptualise the effect of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

CHAPTER 3: GENERATIONAL COHORTS, POSITIVE COPING AND RETENTION FACTORS

KEYWORDS
Generations, generational cohorts, positive coping and retention factors

3.1 INTRODUCTION

This chapter reviews the concepts of generational cohorts, positive coping, and retention factors, as presented in the international and local literature, and presents the theoretical models associated with them that were used to inform this study. The variables influencing generational cohorts, positive coping behaviour and retention factors are discussed, as well as the implications of retaining engineers in the work context. The intention of this chapter is to address the phase 1 research aims, there being 1: to conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature; 2. to identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs, and 3. to conceptualise the influence of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

3.2 THEORY AND RESEARCH: GENERATIONAL COHORTS

3.2.1 Conceptualisation of generational cohorts

According to Upadhyay (2021), a cohort is a group of people who share characteristics, have a common connection, and develop shared values and priorities over their life span. A generational cohort represents a group of people who have shared characteristics, experiences and events within the same era (Ross, 2021). A generational cohort, according to Alwin and McCammon (2003), is a group of people who were born during a given era and share developmental life stages and experiences. Kasasa (2021) discovered that generational cohorts have comparable parental approaches, schooling, music, shopping habits, jobs, careers, and opinions on how people communicate, work ethics, appetite for technological improvement, and retirement.

South African generational cohorts are distinctive in that they have lived through Apartheid, a historical and country-specific political movement (Padayachee, 2018). The history of racial

segregation has impacted the attitudes, behaviors, and values of South African generational cohorts (Padayachee, 2018). A dual system was formed by legislation such as the Industrial Conciliation Act of 1956 and subsequent labor relations (Jonck, 2017). This structure guaranteed that predominantly white Afrikaans-speaking males were exposed to engineering, management, and other technical professions at the cost of other South African populations. Gilchrist (2021) contends that the history of racial segregation has impacted the attitudes, behaviors, and values of South African generational cohorts. It is also important to remember at an individual level, everyone is different, however observing people through a South African generational lens generational attributes are predictable (Gilchrist, 2021). As shown in Table 3.1 generational cohorts have stereotypical characteristics.

3.2.2 Generational cohorts working in South Africa

Jonck et al. (2017) contend that political landscape and economic events play an important role in the formation of a generational identity in South Africa. Deal et al. (2012) support this view and contends that generational cohorts should be categorised according to important historical events. In this regard, the Apartheid Generation, the Struggle Generation, the Transition Generation and the Born Free Generation are unique distinguishable generational cohorts (Booysen et al., 2016) who are working and contributing to the country's economy. Ng and Parry (2016) contend that for the first time in the history of South African, the labour market has a new reality of five generational cohorts working with each other.

The Apartheid Generation correlates with the Silent Generation, born before 1943, and Baby Boomers, born between 1943 and 1960. This generation lived under the all-White government, worked under policies of racial segregation and political sanctions that were brought about by the global community in opposition to apartheid (Jonck, 2017).

The Struggle Generation correlates to Generation X, who were born between 1961 and 1980. They embraced change and were the first generation to work under new labour market regulatory codes, such as the Basic Conditions of Employment Act, Act 75 of 1997 and the Employment Equity Act, Act 55 of 1998 (Jonck, 2017).

The Transition Generation correlates to Generation Y or Millennials, who were born between 1981 and 1993. According to Hoole and Bonnema (2015), this generation is very confident and have an inbred expectation of recognition within the workplace. They grew up being 24/7 connected to the global technological community, have childhood memories of political protests, the release of Nelson Mandela from prison and the political transition to democracy.

Table 3.1

Summary of Generational Cohorts and their Characteristics

Generational Cohort Label, Birth Year and Age	Alternative Generational Cohort Label	Characteristics of the Generational Cohort
Cohort: Silent Generation Born: 1928 to 1945 Age: 73-90 years old	Cohort: Traditionalist Born: 1928 to 1945 Age: 73-90 years old	• Grew up during World War II and are retiring • Loyal, expect to work and retire from the same company • Top-down management approach • Thrive in an advisory and mentoring capacity • Prefer face-to-face interaction and communicate formally through letters of memorandums
Cohort: Baby Boomers Born: 1946 to 1964 Age: 54-72 years old	Cohort: Boomers Born: 1946 to 1964 Age: 54-72 years old	• Workaholics obsessed with their jobs and prefer to spend more time at work than with their family • Want to retire but cannot as they are not good with finances • Task oriented and results driven • Motivated by promotions, prestigious job titles and peer recognition • Prefer face- to-face interaction
Cohort: Generation X Born: 1965 to 1980 Age: 38-53 years old	Cohort: Xers Born: 1965 to 1980 Age: 38-53 years old	• Lack people skills prefer to work independently with minimal supervision • Flexible, capable of adjusting to changing situations, good problem solvers, want to communicate directly with management • First-hand experience with workaholic parents and responsible for creating the work/life balance concept • Motivated by flexibility, enjoy telecommuting, recognition and monetary rewards • Thrive on relationships with mentors, believe career advancement is based on skill rather than position or age.
Cohort: Generation Y Born: 1981 to 1996 Age: 22-37 years old	Cohort: Millennials Born: 1981 to 1996 Age: 22-37 years old	• Not loyal, thrive on job hopping from one organisation to another. • Enthusiastic, have an entrepreneurial spirit, very goal and achievement oriented, want recognition • Motivated by working in collaboration environments, flexible schedules and time off • Want monetary rewards like profit shares • Grew up with internet, tech-savvy and embrace the latest technology • Lack skills with dealing with difficult people
Cohort: Generation Z Born: 1997 and later Age: 0-21 years old	Cohort: iGeneration Born: 1997 and later Age: 0-21 years old	• Digital natives, grown up with smart phones and social media • Motivated by social rewards, mentorship and constant feedback • Have an entrepreneurial spirit and fast decision makers • Demand flexible schedules

Note. This table is adapted from Lancaster and Stillman, 2010, p. 6-14; Pritchard and Whiting, 2014, p.1605-1626; Parry and Urwin, 2017, p.79-96; Padayachee, 2017, p.60-64; Jonck et al., 2017, p.1-9.

The Born Free Generation correlates to Generation Z, who were born after 1994 (Johnston, 2013). This generation was born within the digital age (Lerm, 2014) and are also known as the iGeneration, due to their addiction to the iPhone, iPod, iPad and their continuous hunger for new devices (Waldron, 2012). In 2003, this generation fell under the newly developed Broad-Based Black Economic Empowerment (BBBEE) mandate, a racially selective program that was implemented to empower previously disadvantages racial groups and enhance the South African economy to be fully inclusive of all racial groups. Table 3.2 is a summary of generational cohorts categorised according to South Africa history.

Table 3.2

Summary of Generational Cohorts working in South Africa

Generational Cohort	Date of Birth	South African Generational Cohort	Date of Birth in South Africa	Generational Cohort Categorised According to South African History
Silent Generation	Born before 1943	Apartheid Generation	1928 - 1945	• In 1948 the National Party gained power • All-white government immediately began enforcing policies of racial segregation under a system of legislation called Apartheid
Baby Boomers	1943–1960	Apartheid Generation	1943 - 1960	• Political sanctions were implemented by the global community in opposition to apartheid
Generation X	1961–1980	Struggle Generation	1961 - 1981	• Involved in the struggle against apartheid • Activity participated in protests
Generation Y (Millennials)	1981–1993	Transition Generation	1982 - 1991	• Childhood memories of protests • Nelson Mandela was released from prison • Beginning of the political transformation
Generation Z (iGeneration)	Born after 1994	Born-Free Generation	Born after 1991	• Labour Relations Act no 66 of 1995 influences the employer and employee relations. It deals with collective bargaining, retrenchment, dismissal and dispute resolution. • BBBEE (Broad-Based Black Economic Empowerment), a racially selective program to empower previously disadvantages groups was implemented in 2003

Note. Adapted from Padayachee, 2017, p.60-64 and Jonck et al., 2017, p.1-9.

3.2.3 Theories of generational cohorts

This section outlines the theoretical ideas that support the various constructs of generational cohorts that are relevant to this research. The conceptual description and theoretical principles are instrumental in identifying and understanding behaviour traits of a multigenerational workforce. According to Rudolph et al. (2020) generational cohort theory explains changes and differences that occur across generations. On the contrary to generational cohort theory is the assumption that attitudes, inner values, beliefs and worldview are just merely a function of a biological process which is based on an individual's maturity level and age. Generational cohort theory argues that distinctions across generations are not just attributed to biological processes but are a result of social changes that impact on the individual inclinations and cognitive styles (Rudolph et al., 2020). Of relevance to the study are two theories about generational characteristics, these being the Strauss-Howe Generational theory and Mannheim's theory of Generations.

3.2.3.2 Strauss-Howe Generational Theory

Strauss and Howe (1991) argue that history is made up of 80-year cycles because 80 years correlates to the lifespan of a human being and is further broken down into 20-year cycles. The theory views generations as a cycle and defines generations as prophets, nomads, heroes and artists all of which have existed throughout human history and implies that the characteristics of the next generation can be easily predicted (Lichtenberg & Hoffower, 2021). This theory is limited as it ignores the impact that historical events have on a generation. Furthermore, because the evolution of technology continuously changes an engineer's technical capabilities, this theoretical lens was not considered realistic for this research.

3.2.3.3 Mannheim's Theory of Generations

Karl Mannheim (1952) was a German sociologist and coined the concept of generations in his essay titled "The Problem of Generations". He maintained that generations are shaped according to significant social factors that they are exposed to during their metamorphosis into adulthood. This study is supported by the generational cohort theory, which is based on Mannheim's theory of generations. Over the years researchers have popularized the theory, and in 2021, Dimock maintained that a generation is defined as a cohort of individuals who are cut from the same cloth, not only because they were born during the same period, but more importantly, they share common experiences of world events, technological advancement, changes in the global economy, and social changes, all of which plays an

integral role in distinguishing one generation from another (Dimock, 2021). Scherrer (2018) contends that the standards at which a generation was raised will drive their work ethics, behaviour and attitudes.

Dimock (2021) advocates that dates that distinguish generations can marginally differ by country. For example, in America, generations were shaped by an historical event, such as the Great Depression, and those born before 1943 are referred to as the Silent Generation. In South African, those born between 1928-1945 were shaped by an historical era called Apartheid and are called the Apartheid generation (Padayachee, 2017).

3.3 THEORY AND RESEARCH: POSITIVE COPING

3.3.1 Conceptualisation of positive coping

Engineers working in South Africa are exposed to high levels of workplace stress, as their careers are affected by a volatile economy, increasing business uncertainty, the concern of job security and the ongoing competition for available jobs (Doyl, 2017). Positive coping is defined as coping behavior that has an impact on employee decision-making and the quality of interactions with co-workers and line supervisors (Shikweni et al., 2019). As a result, some employees could interpret a situation as incredibly stressful whereas others would just accept it as normal (O'Brien et al., 2015). Aitken (2011) contends that organisations should first understand how their employees cope with stress and then develop positive coping mechanisms to assist with stress management.

An important life skill for every employee is to learn how to control and balance their stress levels at work (Lewis & Humbert, 2010). Singh and Khanna (2011) contend that stress can never be removed from an employee's life, making positive coping skills necessary to assist in managing stress and preventing harmful emotional and physical effects. Smit (2011) found that in order to build a supportive organisational culture, managers must be more intuitive about their employees' well-being and mindful of how job stress should be managed. On the contrary, Morse et al. (2012) found that if employees could learn positive coping skills it would significantly reduce the burden on the organisation to have wellness schemes.

According to O'Brien et al. (2015), people cope very differently with stressful challenges, some face a challenge in their stride while others may interpret the same challenge as incredibly stressful and psychologically fall apart. Carter (2011) noted that people have a built-in coping reaction when faced with a challenge, and that coping skills help people endure, lessen and

deal with challenges (Morin, 2020). An individual's ability to cope with a challenges rest in its context (Furnes & Dysvik, 2012), with Jensen and Pedersen (2016) concurring that positive coping behaviour allows each person to use their emotional intelligence to cope with stressful situations. People are diverse, and depending on the challenge at hand, display different feelings and reactions (Willis & Willis, 2020) in a situation. By coping with challenges, people can perform at their best both psychologically and physically. Life is full of encounters that challenge a person's coping responses, with positive coping behaviour allowing people to discover appropriate ways in which they can cope with negative and stressful challenges (Marx, 2017).

3.3.2 Theoretic model of positive coping behaviour

The theoretical model relevant to this study is the Positive Coping Behaviour Inventory (PCBI) developed by Coetzee et al. (2017). This inventory measures a cluster of positive psychological constructs that are important for coping with everyday stress. Theoretical concepts underlying the numerous constructions linked to conative, affective, cognitive, and interpersonal behavioural aspects of positive coping behaviour are defined in this section.

a) Conative coping behaviour

Conative coping behaviour is an inner mental process that an employee taps into for overcoming the stress they have experienced. A person's sense of intentional motivation plays an important role in how they approach challenges, decision-making and problem solving. Positive coping is achieved through self-efficacy, adaptability and flourishing (Marx, 2017).

Self-efficacy

Self-Efficacy is the belief in the abilities to accomplish a specific goal or perform a specific task. It must be noted that employees are not genetically equipped with self-efficacy, which is an acquired thinking pattern. Ortlieb and Schatz (2020) found that the higher the employee's self-efficacy, the more they believe they can achieve a specific goal or perform a specific task. Employees with stronger self-efficacy are more inclined to see the bright side of a bad circumstance.

Adaptability

The sort of coping style used by an employee reflects their capacity to adjust to various conditions. When new challenges are presented to employees, adaptability is the key to showcasing their resourcefulness, leadership skills and determination. Some employees adapt

to change with ease, while other employees need coping skills and social support to adjust to fit a situation or new environment (Collie et al., 2020).

Flourishing

Flourishing is a multi-dimensional construct, meaning it is made up of numerous important components, and it can only happen when each dimension or component is working properly. Marais-Opperman et al. (2021) define flourishing as a pattern of positive emotions that occurs when people are happy and content, or when they are learning new things and applying their abilities to new challenges.

b) Affective Coping Behaviour

Affective coping behaviour is also referred to as emotion-focused coping behaviour, as the focus is on improving negative emotional reactions to stress, such as uneasiness, fear, sorrow and anger. Positive coping may be particularly useful in certain situations when something in the situation cannot changed (Ben-Zen, 2017). Research indicates the factors that enable positive coping predicted an increase in both flexibility and life satisfaction (Marx, 2017). Positive, happy employees tend to be successful across several areas in their lives, from their careers, to job performance, income, relationships and their overall well-being. Happiness is the trademark of well-being and sparks a positive affect that creates success. Radebe (2020) contends that a positive affect leads to boosting the generosity, social responsibility and helpfulness of employees.

c) Cognitive Coping Behaviour

When an employee experiences stressful encounters they rely on their inner coping efforts for problem-solving, which involves evaluating and thinking through the problem, in order to avoid unpleasant emotions, feelings and memories. Cognitive coping behaviour involves a conscious psychological approach to interpreting the environmental events around them that affects their emotional state (Schilbach et al., 2020). Cognitive coping behaviour refers to an employee's mental activity and the use of traits such as cognitive attributes, self-esteem, and positive reframing.

Cognitive attributes

Cognitive attributes invoke the mental resources required to carry out any task, from everyday activities such as acquiring knowledge, reasoning, memory, making judgements, processing perceptions and problem solving (Delgado et al., 2020). Piaget (1936) developed the theory of cognitive development, which suggests that humans move through different stages in mental development. The theory deals with the nature of knowledge not being a fixed trait,

instead, intelligence is systematically acquired and nurtured as humans continually interact with the environment around them. Jooste et al. (2013) contend that each person copes with stress differently because people differ in mental development, experiences and cognitive style. To successfully cope with stress, the use of long-term memory and being mentally flexible is essential (Gabrys et al., 2018). According to Marko and Riečanský (2018), cognitive flexibility and the choice of coping strategies that a person uses are interlinked.

Self-esteem

Self-esteem is defined as having two interlinked aspects, these being an employee's subjective evaluation of their own general sense of personal value and their self-worth to an organisation (Carrion, 2020). According to Kim et al. (2020) social support influences self-esteem, which has an important impact on job engagement and retention. Social identity theory suggests that people tend to categorise themselves and others into several social groups, such families, neighbourhoods, professional association memberships, religious affiliations, sporting fraternities and volunteer groups. A sense of social identity is beneficial to one's emotional and psychological well-being (Hodson & Earle, 2020). The roles of engineer, employee, volunteer, and student, for example, are all crucial components of one's total self-view and offer context for one's behavior. An employee with high self-esteem is more confident, can handle criticism, feedback, their emotions, and stress with ease, as they tend to rely on problem-focused strategies (Hodson & Earle, 2020).

Positive reframing

Positive reframing is a positive shift in perception that involves seeing bad events, circumstances, or difficult situations in a positive light (van der Merwe et al., 2020).

d) Interpersonal Coping Behaviour

Interpersonal coping skills are necessary in professional and individual relationships and range from actively listening to knowing how to respectfully communicate. Harmon (2020) contends that healthy interpersonal skills alleviate stress, improve communication and enhance social relationships. Pentina and Zhang (2016) note that positive traits include social support, extroversion and agreeableness.

Social support

The mental and physical comfort supplied by a helpful social network to assist individuals manage in times of need or stress is known as social support (Gilmour et al., 2020). Hunter et al. (2020) found that social networks can be formal or informal, and provide a sense of comfort, safety, belonging and community. Diener et al. (2020) stated that there is growing evidence

that emotional support, such as work engagement, feedback, teamwork, positive coping and collaboration, influences workplace success.

Extroversion

Extroversion is a personality trait that describes an outgoing, socially confident person who is energised by being around other people. Kantor et. al. (1923) introduced personality theory as a clear distinction between attitude types of introversion and extroversion. Introverts like to be low-key, prefer to be alone, and enjoy their own company, according to Kantor et al. (1923), whereas extroverts want to be with others and are more concerned with making a difference in the world.

Agreeableness

Agreeableness is a personality trait that can be described as a person who is usually cooperative, warm, friendly, polity, tactful and has the tendency to put other people's needs above their own. Agreeableness is defined as fundamental to maintaining smooth interpersonal relationships (Fong et al., 2021). Furthermore, it promotes beneficial relationships that promote personal growth and enables coping with everyday demands.

3.4 THEORY AND RESEARCH: RETENTION FACTORS

3.4.1 Conceptualisation of retention factors

Shikweni et al. (2019) found that the South African construction industry is made up of building and civil engineering, which are a primary pillar of the South African economy and contribute significantly to the growth domestic product (GDP) of the country. As a result, the engineering sector is transforming and being reshaped because of the skills shortage, globalisation, rapidly changing technology and a reduction of projects due to the outbreak of the Covid-19 pandemic (Parada, 2020). According to Comins (2021), the latest critical skills list for 2021 shows several engineering skills that includes civil, mechanical, industrial, industrial engineering technologist and civil engineering technologist as all falling under the category of “acute shortage” professional skills that are essential to rejuvenate the South African economy. According to Smith (2020), engineers continue to be one the most sought-after skills in South Africa, with most consulting engineering companies finding it difficult to hold onto their competent and skilled engineers. Parada (2020) contends that while the outbreak of Covid-19 is expected to cripple the South African construction industry, organisations need to be agile, remain financially solvent, rely more on technology and retain their key skilled employees in order to gain operational leverage within the market.

Consulting engineers are in the business of selling their expertise, therefore when a seasoned qualified engineer leaves an organisation it often creates a gap in innovation and services provided (Sandhya & Kumar, 2014). Additionally, when an employee resigns, the organisation loses institutional knowledge and the investment they made into the employee's career (Pena, 2013). As a result, Shikweni et al. (2019) appeal to organisations to invest and retain their valuable skilled employees, as skillful employees are drivers of organisational success. Owing to this, organisations are now forced to recognise and invest in retaining their valuable talent and keeping their employees committed (Reddy et al., 2018). Ngoepe (2018) advocates that despite operating in a very turbulent economy, organisations should be innovative in retaining their valuable employees, as knowledgeable skillful employees give the organisation a competitive advantage. Effective retention techniques, according to Mamun and Hasan (2017), are critical to an organisation's success. As a result, Kashyap and Verma (2018) recommend corporate executives, managers, and human resource managers to figure out why individuals leave an organisation and what variables affect their choice. Employee happiness, according to BountiXP (2020), is a critical component in keeping valued, skilled personnel.

It must be noted that there is no clear definition on retention factors, as opinions differ, although there are two main streams of thinking on this subject. In one, employee retention rests on the shoulders of the organisation and the effort they make in creating a working environment that reassures the employee to remain loyal to the organisation (Sandhya & Kumar, 2014). Coetzee et al. (2015) defined retention as the organisations responsibility to influence an employee's career path to either leave or stay with the organisation. Coetzee et al. (2015) also contend that factors that play a central role in positively influencing employee retention are job satisfaction, career satisfaction, engagement, job embeddedness and commitment.

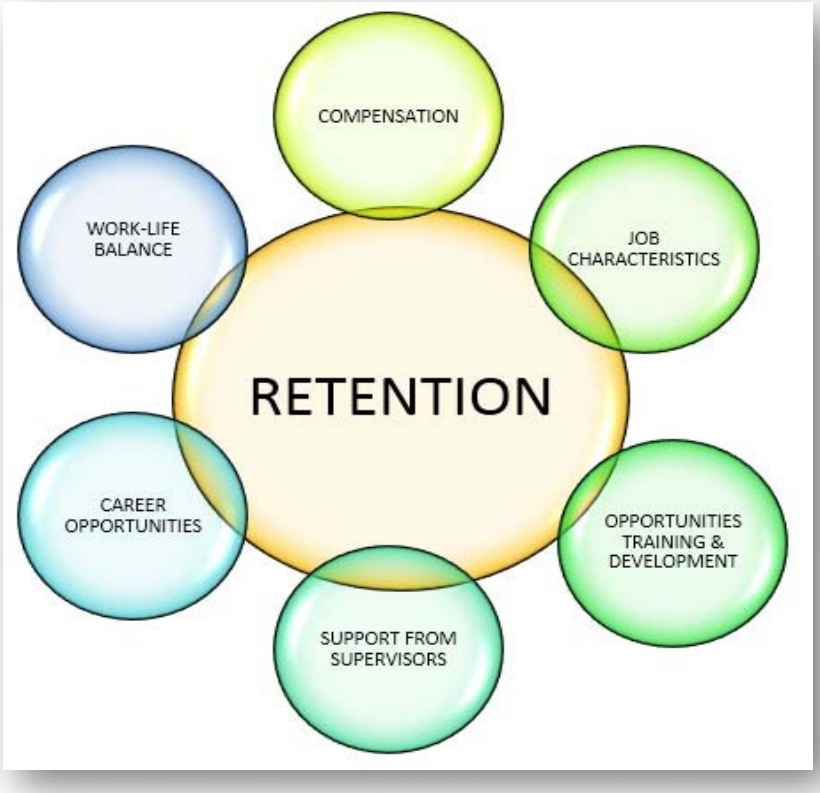
Employee retention, on the other hand, falls on the shoulders of employees, since their own psychological characteristics will impact their decision to stay or leave the company (George, 2015). Retention elements are defined as those that impact an employee's psychological qualities in the context of this study (Döckel, 2003). Döckel (2003) developed a retention factor scale that is relevant to the current study because the author identified six key retention factors (compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities, and a work/life balance) that help to keep employees from leaving.

3.4.2 Döckel's theoretical model of retention factors

The Retention Factor Measurement Scale developed by Döckel (2003) was used for this study since it is the only adult instrument that has been created and assessed in South Africa. As a consequence, the RFMS is useful in this research. Döckel (2003) identified several critical dynamics that fostered retention, these being compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities, work-life balance. Figure 3.1 provides an overview of Döckel (2003) Retention Factor Measurement Scale.

Figure 3.1

Retention Factor Measurement Scale



Source: Adapted from Döckel (2003, p.89).

(a) Compensation

Compensation is the remuneration received and is defined typically as the total cash and non-cash income that an employee receives in exchange for the work they performed. Often market factors beyond the control of the employer forces the continual adjustment of compensation levels, which creates massive income inequality as employers attempt to reduce their employee turnover and retain their top talent (Lemma et al., 2020).

(b) Job characteristics

Baghshykhi et al. (2020) define job characteristics as an important factor in ensuring professional autonomy. Attributes like an employee's aptitude, their working conditions, and the mental and physical demands all influence the employee's performance, motivation and absenteeism. Employees generally want to work in a challenging environment where they can use their specific skills and abilities (Döckel et al., 2006). According to Mamun and Hasan (2017), job characteristics should include a variety of work, opportunity to address difficult challenges, flexibility, effective leadership, and intriguing tasks and projects. Job characteristics, according to Van Dyk (2012), will feature skill diversity and job autonomy, since highly specialized individuals appreciate working on hard projects that allow them to apply a range of abilities while exercising autonomy.

(c) Opportunities for training and development

The key to an employee's success is determined by the training and development they receive in their careers (Döckel et al., 2006). Additionally, employees remain loyal to a company that promotes career opportunities through learning and development programmes (Döckel et al., 2006). Van Dyk and Coetzee (2012) suggests that employees who have access to development opportunities feel appreciated, become loyal and remain with an organisation. Bibi et al. (2018) advocate that training, and development reinforce an employee's self-confidence and ensures that they have a solid understanding of their job attributes.

(d) Support from supervisors

Döckel et al. (2006) define support from supervisors as the support, encouragement and feedback employees receive from their supervisors. According to Rise (2021), when employees receive enough support and encouragement, they become more productive and should be recognised for their abilities, as it entrenches them in the organisation.

(e) Career opportunities

Career opportunities have two aspects, these being internal and external career opportunities. An internal career opportunity gives an employee an opportunity to be promoted or transferred with their current employer, while an external career opportunity is one with a new employer (Joao & Coetzee, 2011). Döckel et al. (2006) contend that perceived career opportunities influence job performance, organisation commitment and turnover. Dhanpat et al. (2019) state that career growth, advancement opportunities and challenging work influences an employee's decision to stay with or leave their current employer.

(f) Work-life balance

A work-life balance, according to Döckel et al. (2003), is an employee's capacity to strike a good balance between work and family duties. They argue that in order to have a beneficial impact on an employee's psychological connection to the company, it must invest in an atmosphere that fosters a favourable attitude toward their work. This may be accomplished by offering remote access for telecommuting, childcare centers, referral programs, and employee help programs to the company's employees. Rise (2021) claims that an employer's health and wellbeing has a significant impact on an employee's overall attitude toward work and lifestyle.

In summary, compensation, job characteristics, chances for training and development, supervisor support, career options, and work-life balance are all elements that influence retention. Bussin et al., (2019) found that retention-related elements all have a significant impact the organisations' success and sustainability.

3.5 DEMOGRAPHICAL VARIABLES INFLUENCING THE RELATIONSHIP BETWEEN GENERATIONAL COHORTS, POSITIVE COPING AND RETENTION FACTORS

Within the South African engineering sector demographical factors such gender, age, race, job level and qualification level are explored in this section. South African organisations still tend to discriminate against job seekers in terms of their gender, age, race, job level and qualification level, as a result job seeker are not employed even if they are fully equipped to fill the position (Tolla, 2020).

3.5.1 Gender

This section explores the relationship between gender the constructs of generational cohorts, positive coping and retention factors, as indicated by other authors.

Generational cohorts

In recent years the South Africa legislation has forced many organisations into achieving a diverse workforce, as a result many organisations are now more than ever heavily invested in promoting and striving towards gender equality. According to Madonsela (2020), the South African engineering sector has always been dominated by males from all generational cohorts, with most of the senior management positions being held by Baby Booms and Generation X males. However, with the assistance of legislation there has been a notable shift in grooming and promoting female engineers across all generational cohorts into more senior supervisory or management roles (Madonsela, 2020). It must also be noted that when an employee's feel

valued and recognised with a promotion or a promise of a promotion it increases productivity levels, increases loyalty and reduces the chances of an employee leaving the organisation (Belyh, 2020).

Positive coping

Studies have found that gender does influence coping responses, as occupational stress has been recognised as a global phenomenon that has had having a negative impact on both employees and organisations. Over the last decade employment patterns within the engineering sector have changed (Madonsela, 2020) as the industry welcomes more female engineers into positions that were previously held exclusively by males. Watson et al. (2011) contends that when subjected to stress at work, male and female employees adopt different coping strategies. This is supported by Wang et al. (2020) men are more likely to employ problem-solving coping techniques to deal with stress, whereas women are more likely to utilise emotion-focused coping strategies. Wang et al. (2020) further noted that men have greater social support than females, and males utilise avoidance as a coping method more frequently than females. Research indicates that there are differences in coping with stress between males and females, which often depends on a person's circumstances (Wu et al., 2020).

Retention factors

According to Madonsela (2020) females are still marginalised in engineering sector not only in South Africa but across the globe, as they are perceived as more family-oriented and not career focused. Gronlund et al. (2018) found that females choose jobs that accommodate their family needs as they value flexible working hours more than higher pay or climbing the corporate ladder. In a recent study conducted by recruitment agencies that place engineers across South African, it was found that professionally qualified female engineers continue to struggle in an historically male-dominated industry (van den Berg, 2019). This sentiment was echoed by the Engineering Council of South Africa (ECSA) as 70% of female engineering graduates felt isolated in their jobs and left the sector shortly after starting their careers (van den Berg, 2019).

In summary it is evident that female engineers feel more challenged within the industry, as a result they have a lower level of attachment and have a higher tendency to leave the organisation compared to male engineers

3.5.2 Race

As suggested by previous scholars, this section investigates the relationship between race and generational cohorts, positive coping, and retention factors.

Generational cohorts

Identification features such as age, culture, race, gender and socio-economic factors were compared and it was found that the younger the individual, the less race matters. When confronted with hardship, an individual's generation influences their thinking style, communication skills, attitude, values, and resilience (OECD, 2020). Within the South African engineering context Black engineers across all generational cohorts still significantly lag behind White Baby Boomers and Generation X engineers, in terms of university qualifications, professional accreditation, technical abilities, experience and compensation (Madonsela, 2020). Joäo and Coetzee (2012) found that black employees across all generational cohorts tend to value career development, career advancement and growth opportunities more than any other race group. Black Generation X and Generation Y employees tend to not find gratification with their compensation level as a result they are not committed to the organisation, which results in them often job hopping in search of better compensation and career advancement opportunities (Jonck et al., 2017).Across all generational cohorts and regardless of race, compensation was found to be the most influential factor in retaining employees (Döckel et al., 2006). Van Dyk (2012) stated that Coloured and Black employees across all generational cohorts were not only dissatisfied with their compensation level, they were also frustrated in their roles and responsibilities within the organisation.

According to Statistics South Africa (2020) over the last decade there has been a notable increase of 35% in the number of black people across all generational cohorts acquiring tertiary qualifications. This increase can be attributed to organisations being forced by legislation into providing more training and development opportunities for Black professionals, to not just upskill employees, but also for attracting and retaining engineers within the industry (Madonsela, 2020).

Positive coping

According to LaVeist et al. (2014) racial differences are apparent in coping behaviour and an individual’s racial group predicts their conative coping strategy. Marx (2017) provided evidence that race significantly predicted social coping and positive coping behaviour, with adaptation and coping strategies being common across all race groups in South Africa (Jonck et al., 2017).

Owing to an increasing employee diversity in the workplace, some employees from previously disadvantaged backgrounds may still be subjected to some form of racial discrimination. Ezzedine and Poyrazli (2020) noted that when employees are coping with race related stress they need to tap into their interpersonal coping skills. Harmon (2020) contends that healthy interpersonal skills alleviate stress, improve communication and enhance social relationships. Ezzedine and Poyrazli (2020) also found that social support was an effective coping style, as it reduces the employees' psychological suffering. On the contrary, according to Griffin and Armstead (2020), Black employees can combat the stresses of racism with a combination of coping skills, namely cognitive coping, as adaptive coping responses assists with problem-solving, and affective coping, as negative emotional reactions of uneasiness, fear, sorrow and anger can be improved.

Retention factors

João and Coetzee (2012) found that with legislation such as affirmative action and employment equity in South African, there was a positive link between race and retention, as organisations are forced to provide career advancement opportunities to previously disadvantaged Black professionals, which guarantees their loyalty and commitment to the organisation. Pauw (2011) supports this view, as organisations provide more opportunities for Black professionals, in terms of growth, training, development and mentorship programs with the view of career advancement, more than for any other race groups in South Africa.

Black and Coloured professionals in South Africa are unsatisfied with their pay, they are disgruntled with their jobs and the duties they perform (Van Dyk, 2011). Compensation and rewards according to Molony (2021), are essential variables in influencing an employee's decision to stay loyal or leave the company.

In summary, within the South African context, many researchers have concluded that there are a number of factors that play a key role in influencing a racial groups' decision to remain loyal or leave the organisation.

3.5.3 Age

Generational cohorts

Baby Boomers and Generation X tend to have a more balanced perspective on their job deliverables as they have more life experiences and are less likely to being upset by minor problems. As a result, they are more very dedicated and focus completely on the job and task

at hand (Geldenhuys & Henn, 2017) and are more committed to the organisation. Ertas (2015) found that the Millennial generation in any sector have a high probability of driving employee turnover more than of the other generational cohorts. This is in contrast to Millennials and Generation Z, who will not hesitate to end their relationship with an organisation when they disagree with the organisations business practices and values (Deloitte, 2019).

Positive coping

According to Malik and Marwaha (2020) emotional, cognitive, social and neurophysiological resources evolve during an individual's lifespan from toddler to adulthood which accounts for their ability and methods of coping. Studies have found that there are notable differences in coping strategies between age cohorts, with the life stage of each age cohort using different coping mechanisms (Zimmer-Gembeck & Skinner, 2016). Hortsmann et al. (2012) support the view that differences in coping strategies between age cohorts confirms that there is a definite link between age and coping behaviour. Li and Tang (2021) concur that patterns of coping strategies are found to change with age. The early workplace experiences that age cohorts are faced with, shapes their attitudes, behaviour and their coping skills. Younger age cohorts use their active rational problem-focused coping, whereas older age cohorts use passive, internal emotion-focused coping (Zimmer-Gembeck & Skinner, 2016). Agrawal and Jaiswal (2013) concur that older age cohorts consistently use more intrapersonal and emotion-focused coping strategies. In 2020 the world was tossed into a crisis by the COVID-19 pandemic, with Ogueji et al. (2021) noting that professionals across all generational cohorts coped by using positive and maladaptive coping strategies.

Retention factors

Vasconcelos (2018) argues that age is a significant factor in employee turnover since older employees are great assets because of their capacity to adapt to change, stay focused, and remain loyal and devoted to the organisation. According to Ertas (2015), the Millennial generation has a greater likelihood of employee turnover than any other generational cohort in any industry. In comparison to older generations, the findings of Lewis and Choi's (2011) research show that younger age cohorts are more open about their intention to leave an organisation.

In summary employee turnover is heavily influenced by age, as older employees are significant assets due to their adaptability to change, ability to stay focused, remain loyal and commitment to the company.

3.5.4 Job Level

According to research, the relationship between job level and generational cohorts, positive coping, and retention factors is explored in this section.

Generational cohorts

Tranmer (2019) confirms that Baby Boomers hold the most senior engineering positions in the industry as a result they have a wealth of valuable knowledge. Left-brained engineers are notoriously poor communicators as a result Tranmer (2019) believes that the biggest hurdle facing the engineering industry is the large communication gap between Millennials and Baby Boomers. Fostering more open communication between Baby Boomers and other generations through a campaign for knowledge transfer (Van der Merwe, 2011) will result in tapping into the best traits of a multigenerational workforce.

Positive coping

Older employees in the engineering industry, regardless of their employment level, encounter several adaptation obstacles, and the relationship between aging, workplace stress, and positive coping is complicated. In a fast-changing market, older workers are now required to keep their knowledge and abilities up to date on a regular basis (Kooij et al., 2020). When people are exposed to high amounts of stress, their positive coping mechanisms and techniques become inefficient, causing them to become unwell and miss work (Kooij, 2020).

Retention factors

Employees who hold top management roles, according to Florentine (2021), have a strong organisational fit, are prepared to make personal sacrifices for the sake of the organisation, are considerably more devoted than lower-level employees, and have a greater retention rate. According to the findings of the study, senior management has a lot more to lose if they quit the company (Van Dyk et al., 2013). Employees on the operational level who do not demonstrate high levels of dedication and think that they are not giving up much by leaving the organisation have a negative influence on retention (Van Dyk et al., 2013).

3.5.5 Qualification Level

This section explores the relationship between qualification level and generational cohorts, positive coping and retention factors, as indicated by other authors.

Generational cohorts

With the high unemployment rate in South Africa, BusinessTech (2019) reported that the prospect of employment significantly increases with the completion of a tertiary qualification, with a bachelor's degree (88.8%), honour's degree (92.7%) or master's or doctor's degree (96.9%) giving an individual a better chance of finding a position. According to Matangira (2020), more Millennials have attended university compared to Generation X, with the former being far more educated than the other generational cohorts.

Positive coping

According to Li and Peng (2020), the COVID-19 pandemic in 2020 triggered the increase in physical and psychological stress levels amongst many professionals including engineers. The authors concluded that frontline medical workers, regardless of their qualification level or job levels, needed to tap into their cognitive and emotional coping and social support to positively cope with the increased levels that the COVID-19 pandemic brought about.

Retention factors

According to Mtshali (2019), the Engineering Council of South Africa encourages professionally qualified engineers to participate in mentorship training programmes to advise and guide young graduates toward their professional development and accreditation. With a professional qualification, an engineer's exposure to more learning opportunities becomes a necessity to maintaining their Continuing Professional Development (CPD) points and their professional standing within the company and industry. The journal Insights for Professionals (2017) maintains that professional development broadens skill sets, fosters peer-to-peer training sessions and encourages engineers to stay loyal to an organisation. Van Dyk and Coetzee (2012) found that employees who have access to development opportunities feel appreciated, become loyal and remain with an organisation. Bibi et al. (2018) also advocate that training and development reinforces an employee's self-confidence and ensures that they have a solid understanding of their job attributes.

In conclusion, generational cohorts differ, with positive coping methods and retention factors influenced by variables such as gender, race, age, work level, and qualification level. However, some employees leave an organisation to cope with stress, making it critical for that organisation to take the lead in implementing successful retention procedures that encourage healthy psychological coping mechanisms for a variety of employee groups.

This line of reasoning poses a very real threat to engineers, regardless of their gender, race, age, job level and qualification level, as an engineer can be easily replaced by smart design

programs or robots that can perform complex design and assembling operations (Krasadakis, 2018). Wilson (2019) confirms that with robotics, algorithms and automation, artificial intelligence has the ability drastically improve productivity and economic growth. Quain (2019) contends that with rapid technological advancement, more organisations will be forced into downsizing their workforce and moving away from a hierarchy management style to adopting a flatter organisational structure.

3.6 EVALUATION AND SYNTHESIS

The literature review provided evidence that organisations face many challenges, such as age diversity and employees being exposed to high levels of workplace stress, which leads to them either staying with or leaving an organisation. The current work-oriented era and threat of unemployment in a volatile South African economy is very real. It is important for organisations to understand how their multigenerational workforce copes with stress, and to develop positive coping strategies and effective retention practices. Table 3.3 Summaries the factors influencing the variables.

Table 3.3

Summary of demographical variables influencing the relationship between generational cohorts, positive coping and retention factors.

Variable	Definition	Sub-variables	Influencing Factors
Generational Cohort	A cohort of individuals that were born during the same period and share common experiences of world events, technological advancement, changes in the global economy, and social changes, all of which plays an integral role in distinguishing one generation from another (Dimock, 2019).	Generational history, unique expectations, experiences, values and lifestyles (Ralph, 2019).	Gender, race, age, job level and qualification level
Positive Coping	Life is fully loaded with encounters that challenge a person's coping responses therefore, positive coping behaviour allows people to discover positive ways in which they must cope with negative and stressful challenges (Marx, 2017).	Inventive coping, Engaging coping, Intentional coping & Influential coping behaviour (Coetzee and Potgieter, 2019)	Gender, race, age, job level and qualification level
Retention Factors	Döckel (2003) noted that critical factors foster retention	Job characteristics, T&D opportunities, Supervisor support, Career opportunities & Work/life balance. (Döckel, 2003)	Gender, race, age, job level and qualification level

Source: Author's own work

3.7 CHAPTER SUMMARY

Generational cohorts, positive coping and retention factors and their corresponding theoretical models were all conceptualised and discussed in this chapter. Occupational stress has been recognised as a global problem with a detrimental impact on both individuals and organisations, and studies have indicated that demographical characteristics (gender, age, race, job level, and qualification level) do influence coping responses and retention. Some employees leave a company to deal with stress, thus it's vital for that company to take the lead in creating successful retention practices that support good psychological coping techniques for a range of employee groups.

The following research aims were achieved:

Research aim 1: To conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature.

Research aim 2: To identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs.

Research aim 3: To conceptualise the effect of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

Chapter 4 discusses the research methodology, with the specific aim of determining the statistical strategies that can be employed to investigate generational cohorts, positive coping and retention factors within the engineering sector in South Africa.

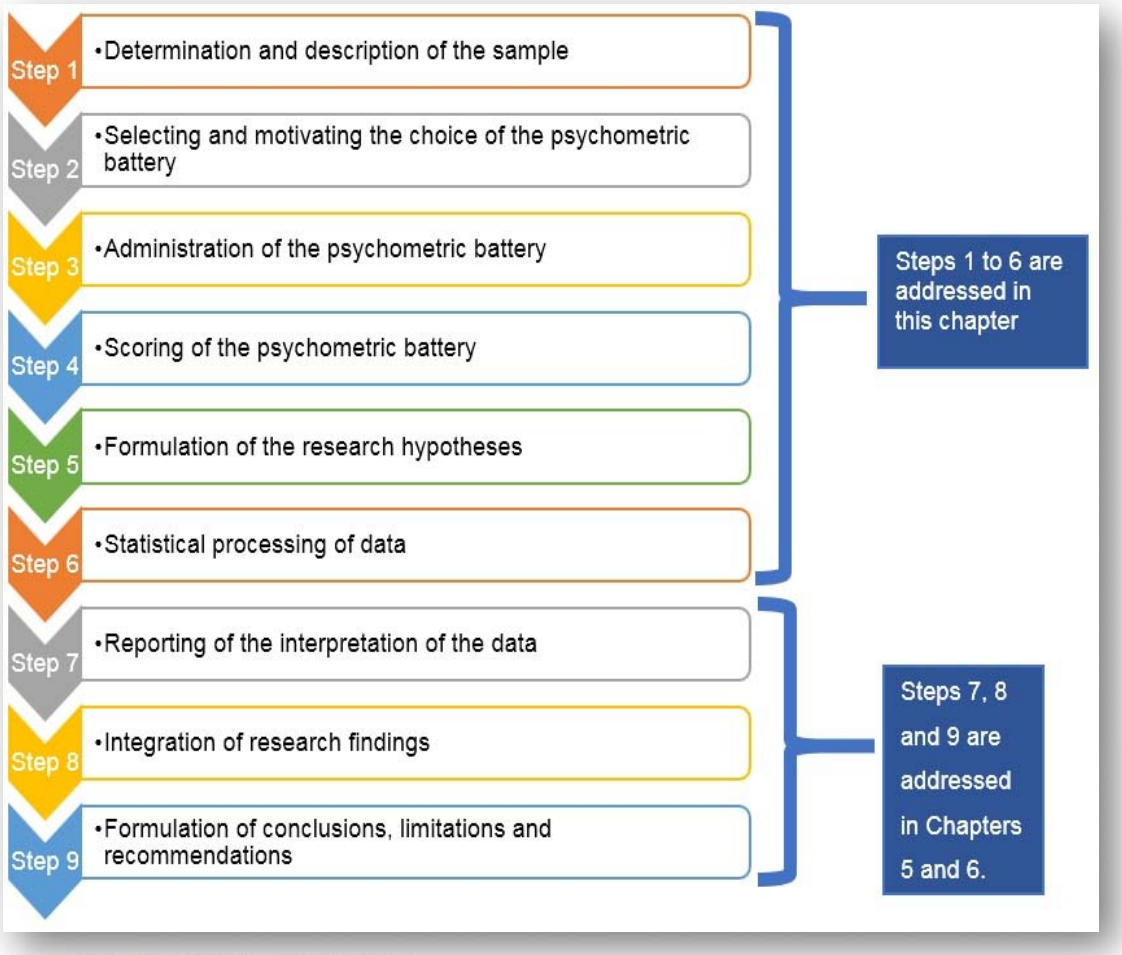
CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter details the empirical investigation undertaken and describes the statistical strategies used to establish associations between generational cohorts, positive coping and retention factors within a sample of full-time employed engineers working in South Africa. This was done by investigating their differences in terms of generational cohorts, positive coping and retention factors in terms of demographical variables (gender, race, age, job level and qualification level). The chapter provides an overview of the research sample, measuring instruments, and the data collection and statistical processing methods used. As illustrated in Figure 4.1, the empirical research phase consisted of nine steps, with steps 1 - 6 being addressed in this chapter, and steps 7 - 9 in Chapters 5 and 6.

Figure 4.1

Overview of the Empirical Research Steps



Source: Authors own compilation

4.2 RESEARCH APPROACH AND DESIGN

This research used a quantitative research strategy since it required to use empirical data to investigate the relationship between generational cohorts, positive coping, and retention factors (Saunders et al., 2016). The goal was to quantify the concepts and generalise the findings to the entire study population. Engineers from all around South Africa contributed empirical data via an online survey, ensuring that the material collected was relevant to the study's aims and that the variables were used in accordance with the theoretical conceptualisation (Hair et al., 2016). Although a cross-sectional study technique has certain drawbacks, such as the inability to assess attitudes over time and draw causal inferences from the data, it also has considerable benefits (Spector, 2019) and was deemed acceptable for the study's goal. Because of the exploratory nature of the study, a cross-sectional research design was perfect, since it allowed for the collection of huge amounts of data from a large target group.

The research design is also cost-effective because it needs the researcher to spend less time gathering data (Spector, 2019). A research design, according to Sileyew (2020), is a logical technique that relates research questions to real study execution. According to Sileyew (2019), the main purpose of a research design is to understand the relationship between the independent and dependent variables, and the research is regarded valid only when it fulfills this goal (Saunders et al., 2016).

The following ethical guidelines were followed by the researcher:

- Ethical approval from the University of South Africa (UNISA) was obtained to conduct the research.
- Permission to collect the data was obtained from both the Consulting Engineers South Africa (ECSA) and DRA Global to access their database of registered engineers.
- A covering letter was included with the questionnaire which assured engineers of their confidentiality and anonymity.
- Engineers were also assured that participation in the research was on a purely voluntary, anonymous basis.
- By completing the research, engineers gave the researcher full consent to uses their responses only for research purposes.
- The Engineering Council and DRA Global emailed all the engineers on their database the LimeSurvey link.

- When engineers clicked on the link, they were given detailed instruction for completing the online survey.
- The questionnaire was divided into three sections. The demographical questionnaire, positive coping behaviour inventory and the retention factors measurement scale
- The demographical questions requested participants to indicate their age, gender, ethnicity, number of years employed with current organisation, employment status, current job level, educational qualification and current position.
- The PCBI measurement instrument (Coetzee & Potgieter, 2019) was used to determine participants conative (motivational) coping behaviour, affective (emotional) coping behaviour, cognitive coping behaviour and interpersonal (social) coping behaviour.
- The RFMS measurement instrument (Döckel, 2003) was used to determine participants' satisfaction to critical dynamics of compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities, work-life balance that foster retention practices.
- On completion of the survey LimeSurvey a professional statistician analysed the data.

The quantitative nature of this research allowed the researcher to obtain valuable descriptive, inferential and explanatory data. Creswell and Creswell (2018) suggested that the main aim of descriptive research is to give a snapshot of the situation as it happens. Based on data from the sample inferential statistics was used to makes generalisations about the larger population (Upadhyay, 2021). Inferential statistics also assisted in drawing conclusion beyond the available data and may assist in predicting future outcomes. George (2021) contends that explanatory research increases understanding and gives directions, rather than simply showing the existence of a relationship between the variables. The intention of this research was to assess the nature, direction, and magnitude of the relationships between the variables rather than establishing cause-and-effect linkages.

4.3 SELECTING AND MOTIVATING THE CHOICE OF THE PSYCHOMETRIC BATTERY

The psychometric battery was chosen after the study of literature review, their selection being informed by their being cost effective, as the measuring instruments are self-administered and self-rated, and are regarded as valid and reliable. The following measuring instruments were identified for inclusion:

- A self-designed demographical questionnaire.
- A Positive Coping Behaviour Inventory (PCBI) the short Version developed by Coetzee and Potgieter (2019).
- A Retention Factor Measurement Scale (RFMS) developed by Döckel (2003).

4.3.1 The Demographical Questionnaire

A self-designed demographical questionnaire was used to obtain personal information such as gender, race, age, job level and qualification level of the participants. They were either required to enter data or select from options provided.

4.3.2 Positive Coping Behavioural Inventory

This section explores the rationale and purpose for using the instrument, the description of the scales, administration, interpretation, validity and reliability, and concluding with the reasons for selecting the Positive Coping Behavioural Inventory (PCBI), short Version which is developed by Coetzee and Potgieter (2019).

4.3.2.1 Rationale and purpose of the PCBI

The PCBI was self-rating measurement instrument and was developed by Coetzee and Potgieter (2019). The PCBI was used to determine participants conative (motivational) coping behaviour, affective (emotional) coping behaviour, cognitive coping behaviour and interpersonal (social) coping behaviour (Coetzee & Potgieter, 2019).

4.3.2.2 Dimensions of the PCBI

The PCBI is a multifactorial questionnaire that comprised of 24 items measuring 4 subscales. Participants had to select a statement that best described their strength in managing their coping behaviour.

- **Conative (motivational) coping behaviour:** 4 statements that measured participants views on how they coped with conative coping behaviour e.g. *I can manage unfamiliar problems effectively.*

- **Affective (emotional) coping behaviour:** 5 statements that measured participants view on how they coped with affective (emotional) coping behaviour e.g. *I feel happy, joyful and excited most of the time.*
- **Cognitive (mental) coping behaviour:** 10 statements that measured participants view on how they coped with cognitive coping behaviour e.g. *I feel confident in managing my negative emotions.*
- **Interpersonal (social) coping behaviour:** 5 statements that measured participants view on how they coped with Interpersonal (social) coping behaviour e.g. *I usually adapt quite quickly.*

4.3.2.3 Administration of the PCBI

The PCBI is a self-administered questionnaire, whereby participants were given clear instructions on how to complete the questionnaire. It takes approximately 3 – 5 minutes to complete.

4.3.2.4 Interpretation of the PCBI

The PCBI has 4 subscales with a total 24 items. The subscales conative (motivational) coping behaviour had 4 statements, affective (emotional) coping behaviour had 5 statements, cognitive coping behavior had 10 statements and interpersonal (social) consisted of 5 statements. The subscales were measured separately and was designed to mirror the participants preferences to coping behaviour. For example, for conative coping behaviour participants had to assess how well they manage unfamiliar problems effectively by selecting the appropriate option from the 5-point Likert-type scale below:

1 = Not Strong
2 = Somewhat Strong
3 = Strong
4 = Very Strong
5 = Strongest

The subscale with the highest mean scores indicated the positive coping behaviour subscale that participants mostly used.

4.3.2.5 Validity and reliability of the PCBI

Research studies have revealed substantial support for the validity and reliability of PCBI, a factor analysis conducted by Coetzee and Potgieter (2019) confirming the construct validity of the questionnaire. In respect of internal consistency reliability, the authors reported that Cronbach's alpha coefficients for conative (motivational) coping (.77), affective (emotional) coping (.83), cognitive (mental) coping (.91) and interpersonal (social) coping (.67). Research has confirmed the correlation between the PCBI and the variables in the coping behaviour inventory are a valid measure of coping behaviour can be used for future research (Coetzee & Potgieter, 2019).

4.3.2.6 Motivation for selecting the PCBI

Within a South African context, the PCBI (Coetzee & Potgieter, 2019) is well known and was designed and tested to measure an employee's personal resources that assist the employee with positive coping behaviour. The PCBI is also a valid and reliable psychological measurement of what type of coping behaviour (conative, affective, cognitive or interpersonal coping behaviour) that participants tap into. The purpose of the research was to investigate several trends and relationships between variables providing a better understanding, knowledge and insight into positive coping behaviour, therefore the PCBI measuring instrument was considered to be acceptable for this research.

4.3.3 The Retention Factor Measurement Scale

This section explores the rationale and purpose for using the instrument, the description of the scales, administration, interpretation, validity and reliability, and concluding with the reasons for selecting the Retention Factor Measurement Scale (RFMS), developed by Döckel (2003).

4.3.3.1 Rationale and purpose of the RFMS

The RFMS was self-rating measurement instrument and was developed by Döckel (2003). The RFMS was used to determine participants' satisfaction to critical dynamics of compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities, work-life balance that foster retention practices (Döckel et al., 2006).

4.3.3.2 Description of the scales of the RFMS

The RFMS is a multifactor questionnaire that measured six subscales. Participants were asked to choose a statement that best reflected their level of satisfaction or dissatisfaction with the organisation.

- ***Remuneration:*** 3 statements were used to gauge participants' opinions on compensation, such as the present total wage package (base pay, benefits and incentives).
- ***Job characteristics***: 3 statements that assessed participants' perceptions of job qualities, such as "the job necessitates the usage of a lot of sophisticated or high-level skills."
- ***Training and development:*** Participants' attitudes about training and development were examined using 4 statements, such as "the employer is providing me with job-specific training."
- ***Supervisor support:*** 3 statements assessing participants' emotions regarding supervisory assistance, such as job-specific training, praise, and recognition from co-workers.
- ***Career opportunities:*** 3 phrases that assessed participants' perceptions of career chances, such as "This organisation has enough career opportunities for me."
- ***Work-life balance:*** 4 statements that assessed participants' views on work-life balance, such as "my job has a detrimental impact on my personal life."

4.3.3.3 Administration of the RFMS

The RFMS is a self-administered questionnaire, whereby participants are given clear instructions on how to complete. The self-explanatory questionnaire. It takes approximately 10 - 15 minutes to answer the statements.

4.3.3.4 Interpretation of the RFMS

The RFMS has six subscales with a total of twenty-four statements. Each subscale (compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities and work-life balance) is measured using the 5-point Likert-type scale and is designed to mirror the participants preferences and feelings with retention

factors. Participants were expected to rate each statement by selecting an appropriate option from the scale below:

1 = Strongly dissatisfied
2 = Moderately dissatisfied
3 = Slightly dissatisfied
4 = Moderately satisfied
5 = Strongly satisfied

The higher the score given to a statement, the more satisfied the employee feels with each subscale (compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities and work-life balance) as a result the highest mean scores reveals which retention factor is most valued by the participants.

4.3.3.5 Validity and Reliability of the RFMS

Research studies have revealed substantial support for the validity and reliability of retention factor scales. A factor analysis of the RFMS conducted by Döckel (2003) confirmed the construct validity of the questionnaire. In respect of internal consistency reliability, Döckel et al. (2006) report the following Cronbach's alpha coefficients for compensation (.86), job characteristics (.17), training and development opportunities (.93), supervisor support (.33), career opportunities (.92) and work/life balance (.88).

4.3.3.6 Reasons for selecting the RFMS

Within a South African context, the RFMS (Döckel, 2003) is well known and was designed and tested to measure retention practices within various organisations. The RFMS is also a valid and reliable psychological measurement of six critical factors that aid in the retention of valuable employees.

The purpose of the research was to investigate several trends and relationships between variables providing a better understanding, knowledge and insight into the retention factors, therefore the RFMS measuring instrument was acceptable for this research.

4.4 LIMITATION OF THE MEASURING INSTRUMENTS

From a first-person perspective, a self-reporting questionnaire is the most direct approach of enquiring about an employee's psychological well-being (Tang & Tang, 2020). Through the

series of questionnaires in the questionnaire survey, this research used only self-reporting instruments as these were found to be cost effective and useful in assessing the participants feelings, experiences and behaviour. There are several drawbacks to using self-reporting instruments, including the fact that Likert-style responses are purely subjective, that participants are not always truthful, and that ambiguous wording could be interpreted differently by participants, jeopardizing the data's reliability and validity (Pekrun, 2020). These limitations were considered during the interpretation of the outcomes of the research results.

4.5 DECRIPTION OF THE POPULATION AND SAMPLE

In statistics, a population is defined as people, departments, organisations, phenomena or activities that have similar characteristics that the researcher wishes to research, with the aim of obtaining insight and gaining new knowledge (Hair et al., 2016). In social and behavioural research, people are the most common sampling unit used, although sampling can also include events, places and periods of time (Salkind, 2018). The purpose of this research was to select a representative sample from the population, investigate relationships between variables, and once true associations are found, to draw conclusions and generalisations to the entire population (Salkind, 2018).

According to Borden and Abbott (2018), it is not feasible to survey an entire population, which results in researchers selecting a group of people from the population. Kenton (2021) refers to a sample as a smaller more manageable size of a population, as it is not practical to survey a large population. Trochim (2020) states that the sample is the group of people who actually participate in the research, with sampling being the process of selecting a pre-determined number of observations through the process of statistical analysis, whereby generalisations are made back to the population that was chosen. Vasileiou et al. (2018) echoed this sentiment but noted that only certain traits of the population will be represented. A relatively large sample size would therefore be required to get enough data to adequately describe the area of interest and address the research questions. McCombes (2019) contends that to draw concrete conclusions from results, careful consideration must first be made when selecting a sample, as they must be representative of the larger population.

McCombes (2019) posits that there are two groupings of sampling methods, one being probability and other being non-probability sampling. Probability sampling practices are further broken down to simple random sampling and stratified random sampling. Islam (2021) states that with simple random sampling, people are randomly selected, therefore everyone in the population have an equal chance of being selected to participate.

Probability sampling is mainly used in quantitative research and involves a random selection of people to participate in the survey. Probability sampling is ideal for making statistical inferences about a population (Elliott, 2020). For the purpose of this research, the type of probability sampling used was stratified sampling. A stratified, random sample of 151 engineers from different genders, race, age, job level and qualification level were drawn from the total population.

The population of this research project consisted of engineers from civil, process, mining, electrical and mechanical disciplines across South Africa. The online questionnaire was sent out to 2500 potential participants of whom 152 completed the online questionnaire. However, only 151 questionnaires were completed in full and were identified as usable for the purpose of the research, with a response rate of 6.04% being low, which means that the findings of the study cannot be generalized to the entire population.

4.5.1 Distribution of gender groups in the sample

Table 4.1 and Figure 4.2 has a good visual illustration of the gender distribution of participants in the sample. Male participants made up 89.4%, whereas female participants only made up 10.6% of the sample (N = 151).

Table 4.1

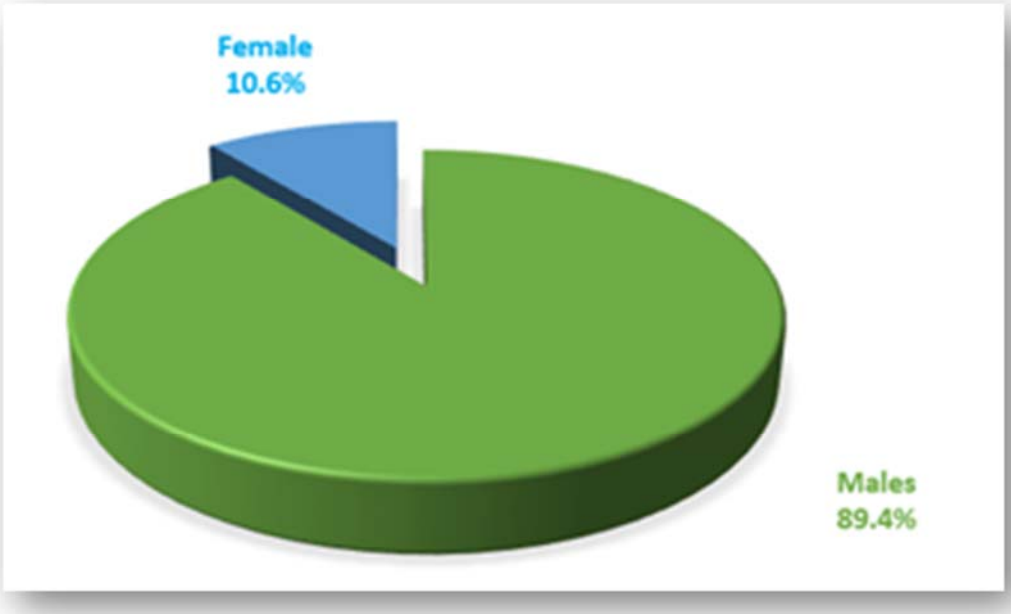
Gender Distribution of Sample (N = 151)

Gender	Frequency	Percent	Valid percent	Cumulative percent
Males	135	**89.4**	89.4	89.4
Females	16	10.6	10.6	100.0
Total	151	100.0	100.0	

Source: Author's own work

Figure 4.2

Gender Distribution of the Sample (N=151)



Source: Author's own work

4.5.2 Distribution of race groups in the sample

This section provides information on the race groups of the sample. Table 4.2and Figure 4.3illustrate the racial distribution in the sample. Whites made up 66.9%, Black Africans made up 19.9%, Indian/Asians made up 8.6% and Coloureds made up 2.6%of the total sample of research participants (N = 151). The frequency table showed that the White racial group made up the majority of the sample at 66.9%.

Table 4.2

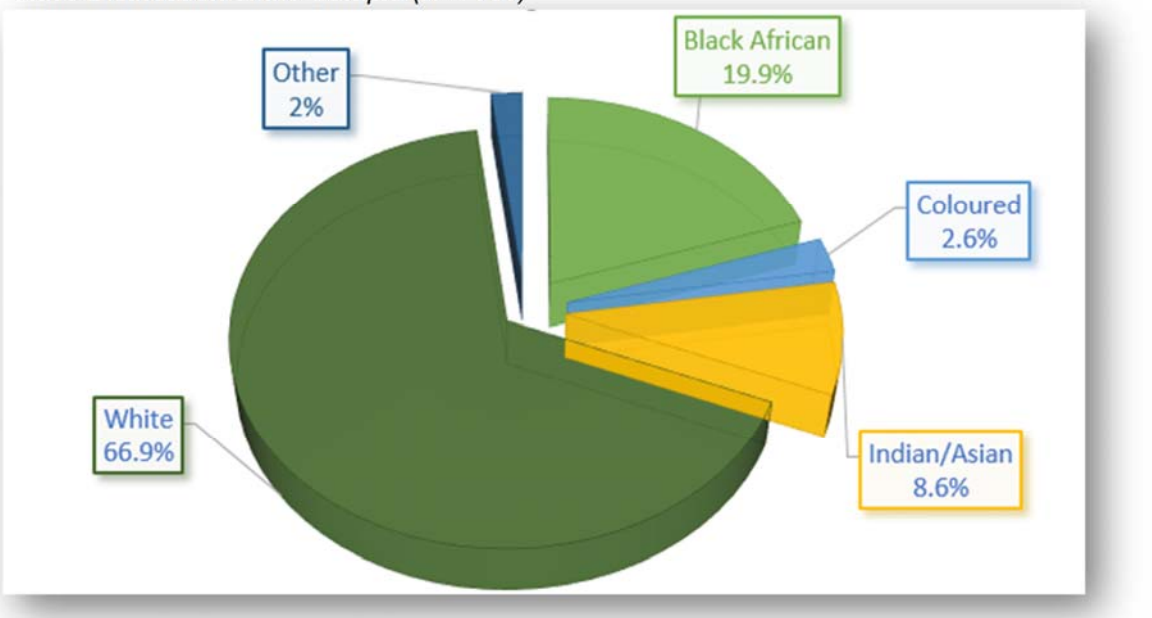
Race Distribution of Sample (N = 151)

Race	Frequency	Percent	Valid percent	Cumulative percent
Black African	30	19.9	20.3	20.3
Coloured	4	2.6	2.7	23.0
Indian/Asian	13	8.6	8.8	31.8
White	101	**66.9**	68.2	100.0
Other	3	2.0		
Total	151	100.0	100.0	

Source: Author's own work

Figure 4.3

Race Distribution of the Sample (N = 151)



Source: Author's own compilation

4.5.3 Distribution of generational cohorts in the sample

This section provides information on generational cohorts of the participants, as indicated in Table 4.3 and Figure 4.4. The participants' ages were categorized according to their birth year, which was then divided into several generational cohorts. The age distribution of the sample shows that participants born between 1961 and 1980 (Generation X) accounted for 47.7%, birth years between 1983 and 1993 (Generation Y) accounted for 41.1 percent, birth years between 1943 and 1960 (Baby Boomers) accounted for 7.3 percent, and all participants born after 1994 (Generation Z) accounted for 4% of the total sample of research participants (N = 151). Generation X, with birth years spanning from 1961 to 1980, accounted for majority of the sample at 47.7%.

Table 4.3

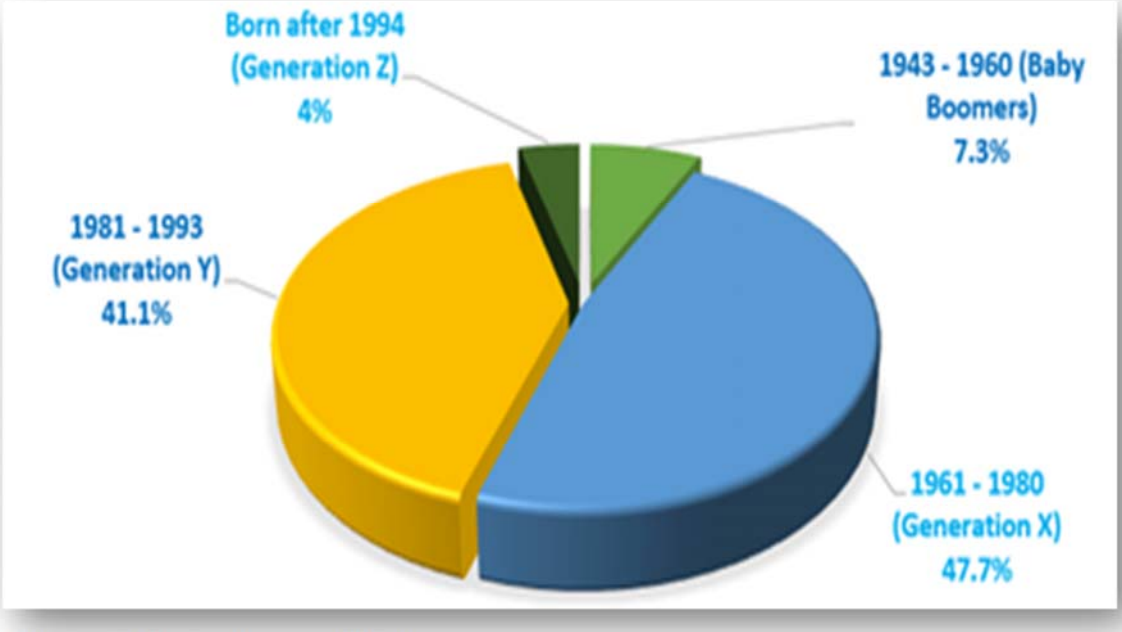
Generational Cohort Distribution of Sample (N = 151)

Age Group (Generational Cohort)	Frequency	Percent	Valid percent	Cumulative percent
1943 - 1960 (Baby Boomers)	11	7.3	7.3	7.3
1961 - 1980 (Generation X)	72	**47.7**	47.7	55.0
1981 - 1993 (Generation Y)	62	41.1	41.1	96.0
Born after 1994 (Generation Z)	6	4.0	4.0	100.0
Total	151	100.0	100.0	

Source: Author's own compilation

Figure 4.4

Generational Cohort Distribution of the Sample (N=151)



Source: Author's own compilation

4.5.4 Distribution of job level groups in the sample

This section provides information on the job level of the sample. Table 4.4 and Figure 4.5 indicates the job level distribution of the of the sample indicates that 37.7% were professional engineers, 13.9% of participants indicated they filled other positions.13.2% were professional engineering technologists, 13.2% were candidate engineers, 6% were professional certificated engineers, 6% were candidate engineer technologists, 3.3% were professional engineering technicians, 3.3% were graduates, 2% were candidate certificated engineers and 1.3% were candidate engineering technicians. The total sample of research participants being (N = 151). The frequency table showed that professional engineers made up 37.7% of the sample.

Table 4.4

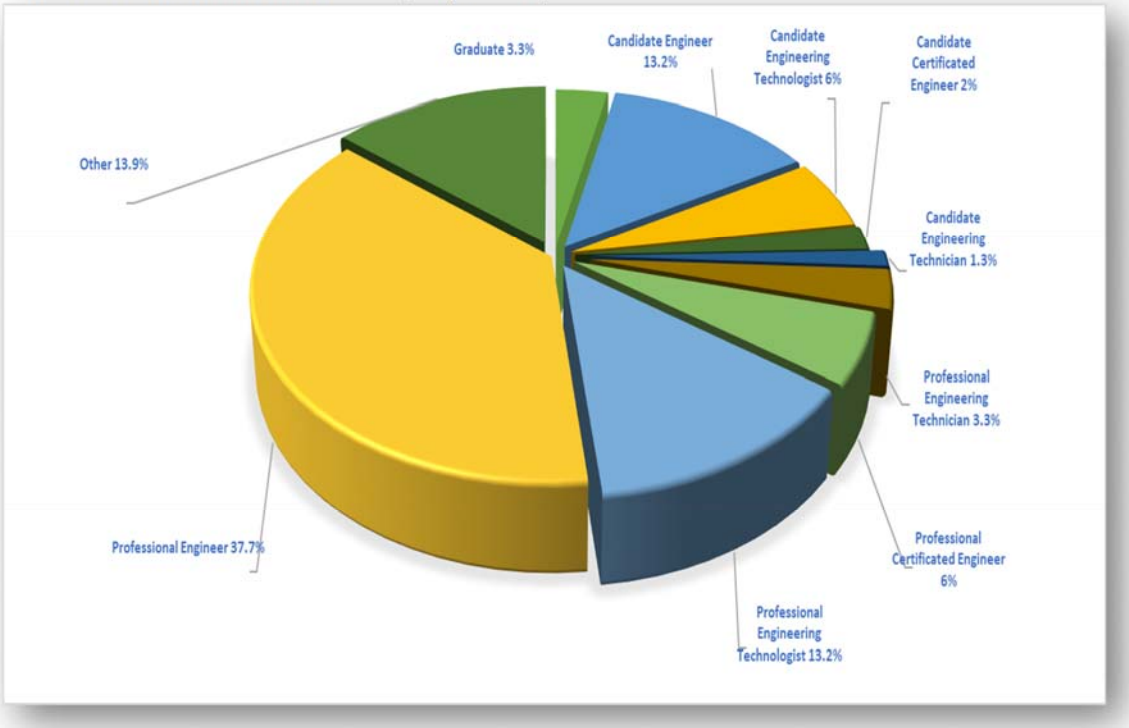
Job Level Distribution of Sample (N = 151)

Job Level	Frequency	Percent	Valid percent	Cumulative percent
Graduate	5	3.3	3.8	3.8
Candidate Engineer	20	13.2	15.4	19.2
Candidate Engineering Technologist	9	6.0	6.9	26.2
Candidate Certificated Engineer	3	2.0	2.3	28.5
Candidate Engineering Technician	2	1.3	1.5	30.0
Professional Engineering Technician	5	3.3	3.8	33.8
Professional Certificated Engineer	9	6.0	6.9	40.8
Professional Engineering Technologist	20	13.2	15.4	56.2
Professional Engineer	57	**37.7**	43.8	100.0
Other	21	13.9		
Total	151	100.0	100.0	

Source: Author's own compilation

Figure 4.5

Job Level Distribution of the Sample (N=151)



Source: Author's own compilation

4.5.5 Distribution of qualification level in the sample

This section provides information on the qualification level of the sample. Table 4.5 and Figure 4.6 indicate the qualification level distribution of the of the sample. Participants with a bachelor's degree or advanced certificate with an NQF level 7 made up 49.7%, participants with a postgraduate diploma or professional qualification with an NQF level 8 made up 19.2%, participants with a master's degree, NQF level 9 made up 18.5%, participants with a diploma or advanced certificate with an NQF level 6 made up 8.6%, Grade 12's that obtained an NQF level 4 made up 1.3% and 0.7% of participants held a doctoral degree, NQF level 10. The total sample of research participants was (N = 151). The frequency table showed that overall, 98.7% of the participants in the sample had obtained a postgraduate level qualification.

Table 4.5

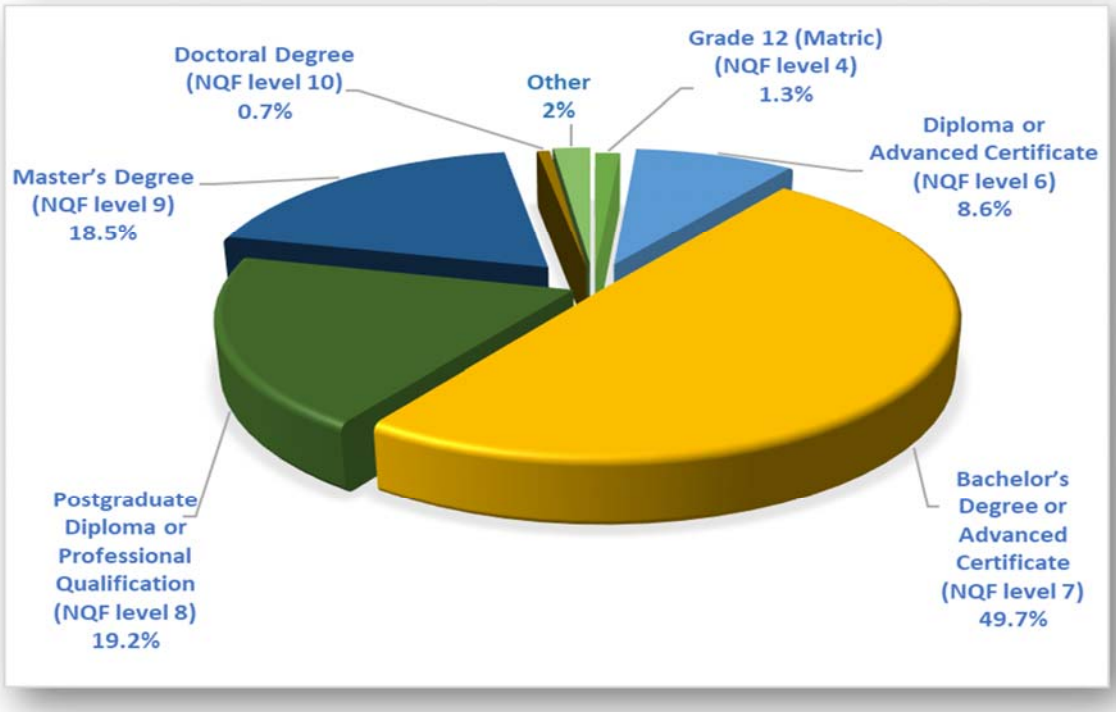
Qualification Level Distribution of the Sample (N = 151)

Qualification Level	Frequency	Percent	Valid percent	Cumulative percent
Grade 12 (Matric) (NQF level 4)	2	1.3	1.4	1.4
Diploma or Advanced Certificate (NQF level 6)	13	8.6	8.8	10.1
Bachelor's Degree or Advanced Certificate (NQF level 7)	75	**49.7**	50.7	60.8
Postgraduate Diploma or Professional Qualification (NQF level 8)	29	19.2	19.6	80.4
Master's Degree (NQF level 9)	28	18.5	18.9	99.3
Doctoral Degree (NQF level 10)	1	0.7	0.7	100.0
Other	3	2.0		
Total	151	100.0	100.0	

Source: Author's own work

Figure 4.6

Qualification Level Distribution of the Sample (N = 151)



Source: Author's own compilation

4.5.6 Summary of demographical profile of the sample

In summary, the demographical profile of the sample shows that important characteristics like gender, race, age, job level and qualification level needed to be taken into consideration in order to explain the empirical results of the research. The participants in the sample were predominantly white males that were born between 1961 and 1980 and fell into the Generation X cohort. With the most predominant job level in the sample being professional engineers and the majority of the participants had a bachelor's degree or an advanced certificate with an NQF level 7 qualification. Table 4.6 reflects the predominate characteristics of the sample.

Table 4.6

The Main Characteristics of the Sample (N = 151)

Biographical variable	Predominant characteristic	Percentage
Gender	Male	89.40%
Race	White	66.90%
Age (Generational cohort)	Born between 1961 - 1980 (Generation X)	47.70%
Job level	Professional engineer	37.70%
Qualification level	Bachelor's Degree or Advanced Certificate(NQF level 7)	49.70%

Source: Author's own compilation

4.6 ETHICAL CONSIDERATIONS IN ADMINISTRATION OF THE PSYCHOMETRIC BATTERY

The researcher first obtained ethical clearance and permission to conduct the research from the University of South Africa's Research Ethics Committee as a result the research followed all the principles of ethics as outlined in the UNISA Research Ethics Policy.

An invitation to voluntarily participate in the research was emailed to all participants, which details the purpose, reasons for research, anticipated time allocation, assurance of privacy and confidentiality, and a link to the online questionnaire. To ensure anonymity, the online survey did not require participants to provide any personal information, and its completion of the online survey was viewed as having provided informed consent.

In compliance with South African legislation, the measuring instruments used were not biased against any engineer in any way and were fairly applied to all engineers across the country. Additionally, the measuring instruments were scientifically valid and reliable. The entire data collection process was regarded as reliable, with the data analysis, reporting and interpretation of the findings being conducted in a fair, valid and reliable manner. Throughout the research process, the researcher strived for impartiality and validity in the collecting, recording and analysis of the data, as well as in the interpretation of conclusions.

4.7 CAPTURING OF CRITERION DATA

Using the on-line survey software program LimeSurvey. The survey was also tested to ensure that it was free from errors before it was sent out to any participants. The Engineering Council of South Africa and DRA global HR administrator sent out the online survey link to 2 500 engineers. On completing the questionnaire, all responses were recorded electronically, and

the participant was thanked for his/her participation. The process of data collection was not biased in any way as the survey link was sent out to all engineers regardless of age, gender, race, job level or qualification level. The data collection process was also reliable, and the data was evaluated, reported and interpreted in a fair, valid and reliable manner. To also guarantee confidentiality the researcher received the completed questionnaires through the external on-line survey program called LimeSurvey. All the result from the web-based survey software was exported into a Microsoft Excel spreadsheet, which assisted in the processing, understanding and reporting of the data.

An independent statistician imported all the scored data from the completed questionnaires, and then the statistician used statistical programs called IBM SPSS Statistics Version 26 to conduct the descriptive analysis, and Bond & Fox Analysis Version 1.0.0 to perform the Rasch analysis. Process procedure was not used as no mediation or moderation analysis was conducted.

The accuracy of the data was sound as the data was entered into databases on the online platform, which prevented possible human error in the data capturing process, with respondents being required to complete all the questions before being able to close the program.

4.8 FORMULATION OF RESEARCH HYPOTHESES

A hypothesis is described as a specific educated predictive statement or a testable concrete statement about the relationship between two or more variables. The purpose of a hypothesis is to investigate an area of interest in more detail in order to develop specific prediction that can be tested in future research (Trochim, 2020). In the literature review chapters, the main research hypothesis was formulated by determining whether a relationship exists between generational cohorts, positive coping behaviour and retention factors. Table 4.7 below reflects the formulated research hypotheses to meet the empirical objectives and to achieve the criteria for the formulation of the hypotheses.

Table 4.7

Research Hypotheses

Research aim	Research hypothesis	Statistical procedure
Research aim 1: To conduct an empirical investigation into the statistical association between generational cohorts, positive coping and retention factors in a sample of engineers employed in the South African engineering sector and to identify the implications of the employee retention practices.	**H1:** There is a significant and positive relationship between generational cohorts, positive coping and retention factors.	Spearman Correlational analysis
Research aim 2: To empirically investigate whether a theoretical relationship does exist between generational cohorts, positive coping and retention factors in terms of demographical variables (gender, race, age, job level and qualification level) in the sample of engineers employed in South Africa.	**H2:** Differences exist among generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels).	Multiple regression analysis
Research aim 3: To formulate recommendations for engineering companies regarding the demographical variables (gender, race, age, job level and qualification level) that influence the theoretical relationship between generational cohorts, positive coping and retention factors.	**H2:** Differences do exist in generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job level and qualification level) from a paradigm perspective.	Test for significant mean differences

Source: Author's own work

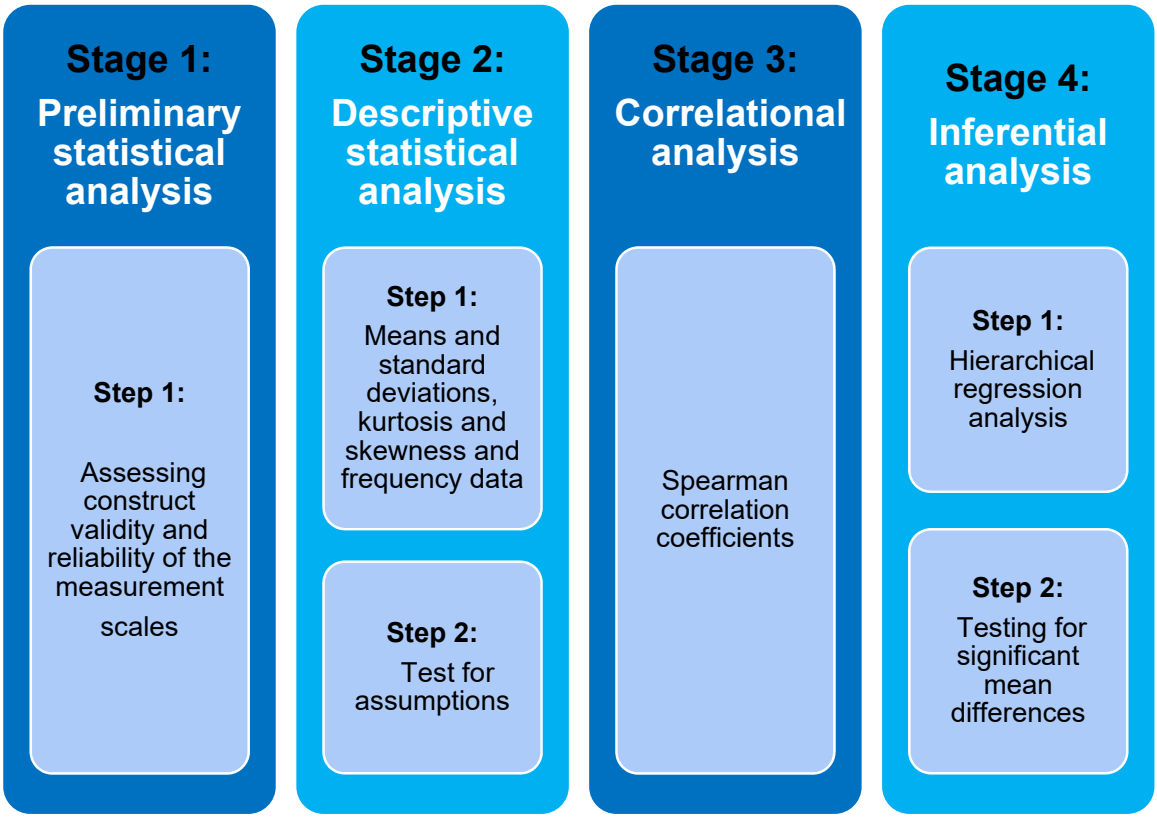
4.9 STATISTICAL PROCESSING OF THE DATA

The statistical processing of data included four stages, with each stage playing an important role in accurately analysing, interpreting and reporting the data. In the preliminary statistical analysis stage, testing for common method bias was necessary to check the data for any discrepancies in responses and if any errors were found they were corrected. This stage also included assessing the measurement model validity and internal consistency reliability by means of the Cronbach alpha coefficient (α) and the composite reliability (CR) coefficient. In the preliminary descriptive statistical analysis stage, the means and standard deviations, kurtosis and skewness of the categorical and frequency data was analysed and underlying assumptions were tested. The correlation analysis stage the Spearman's rank correlation coefficient was used to measure the relationship between the variables. In order to draw conclusions from the data the inferential analysis was the final stage in which multiple regression analysis namely the Hierarchical regression analysis was applied to test the

research hypothesis and to test for significant mean differences was conducted. Figure 4.7 illustrates the stages followed in the statistical analytical process.

Figure 4.7

Overview of the Data Analysis Process and Statistical Procedures



Source: Author's own work

4.9.1 Stage 1: Preliminary statistical analysis

The data was subjected to preliminary statistical analysis was to assess the construct validity and reliability of the measurement scales.

Step 1: Assessing construct validity and reliability of the measurement scales

To assess for internal consistency and reliability of each measurement scale the Cronbach's alpha coefficients was used, this being the most common methods for checking internal consistency reliability and was used to recap the demographical data, Positive Coping Behaviour Inventory (PCBI) and Retention Factor Measurement Scale (RFMS). Bond & Fox Analysis Version 1.0.0 was used to perform Rasch analysis to quantify the strength of the inferences obtained from instruments, compute participant responses and test the construct

validity. Boone (2016) contends that a Rasch analysis is a psychometric technique that was developed to assist researchers enhance the precision with which they design instruments, evaluate instrument quality, and calculate participant responses.

4.9.2 Stage 2: Descriptive statistical analysis

This stage consisted of two steps, the first step was to determine the means (M) and standard deviations (SD), kurtosis and skewness and frequency data and the second step was to test for assumptions.

Step 1: Means and standard deviations, kurtosis and skewness and frequency data
Means and standard deviations for all the construct variables of the demographical information of participants, positive coping psychological constructs (conative, emotional, cognitive, and interpersonal coping behaviour) and the critical dynamics that fostered retention factors (compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities, work-life balance) were calculated.

Descriptive statistical analysis is used to summarise trends, patterns and visible characteristics of a sample (Hillier, 2021). Descriptive statistics was used to analyse the data in a way that systematically arranges it and highlights the key numerical results (Kaur et al., 2018). Furthermore, descriptive statistics summarises the data that is measured ‘on average' and how strongly two or more aspects are connected. The sample's categorical and frequency data, including means and standard deviations, were calculated to assist in the application of statistical techniques.

When calculating the mean score, the total number of confirmed values is divided by the total number of values in the group, this mathematical average being the mean score (Dahlan, 2021). According to Salkind (2018), the standard deviation is a measurement of the spread of data distribution, and measures the departure from the mean, this being important to indicate a central tendency in statistics.

Salkind (2018) found that when sample groups data is parallel on both sides the middle point is considered symmetrical. The degree to which a score distribution deviates from middle point is referred to as skewness. The skewness for a standard distribution is zero and any symmetric data should have a skewness near zero. Negative skewness numbers show data that is skewed left, whereas positive skewness values suggest data that is slanted right (Frey, 2018).

Field (2013) advocates that kurtosis measures the degree to which scores cluster in the tails of frequency distribution. Heavy tails or outliers are more common in data sets with a high kurtosis. In data sets with low kurtosis, light tails and a lack of outliers are typical (Salkind, 2018).

Step 2: Test for assumptions

In general, research seeks to draw reliable conclusions from a sample of data collected from a population. Unfortunately, problems might transpire when samples from the population are used to provide precise values that are applicable to the entire population. As a result, statistical techniques were used in the current research to determine the extent to which specific conclusions about the research findings might be derived. The multivariate methods and tests for significant mean differences used in this research were based on the following assumptions:

(a) The accuracy of data entered into the data file and missing values

Only questionnaires that were fully completed was accepted. All the items were found to be within the likely range of values, indicating that the data was appropriate for further investigation. To ensure data accuracy, the minimum and maximum values, as well as the averages and standard deviations, were examined.

(b) The ratio of cases to independent variables

The sample size of N = 151 in this study was considered adequate to accomplish acceptable statistical power. Statistical power is a measure that measures how likely it is for a researcher to find statistical significance in a sample assuming the effect is present in the entire population. This was required for the determination of effects through correlation and regression analysis.

4.9.3 Stage 3: Correlation analysis

Correlation analysis was used to determine if there is a significant and positive relationship between generational cohorts, positive coping and retention factors (research aim 1). A Spearman rank correlation was applied to test research hypothesis 1 (H1):

H1	There is a significant and positive relationship between generational cohorts, positive coping and retention factors.

To test for normalcy, the skewness and kurtosis were calculated. These tests revealed that the data was not normally distributed and non-parametric statistics were appropriate for this research. The Spearman rank-order correlation coefficient (also known as Spearman's correlation) is a nonparametric measure of the degree and direction of link between two variables on a scale of at least one ordinal (Butler & Graff, 2021). The nature of the relationships between the variables was assessed and described using a Spearman correlation. The Spearman correlation evaluates the degree of relationship between variables without making any assumptions about their frequency distribution. Spearman Correlation uses an arbitrary monotonic function to represent the connection between two variables. It may be used for ordinal variables, unlike the Pearson's coefficient test, which implies a linear connection between variables and that the variables are scored on interval scales.

4.9.4 Stage 4: Inferential analysis

Based on data from the sample inferential statistics was used to makes generalisations about the larger population (Upadhyay, 2021). Inferential statistics also assisted in drawing conclusion beyond the available data and may assist in predicting future outcomes. This stage consisted of two steps, the first step was the hierarchical regression analysis and in the second step testing for significant mean differences was conducted.

Step 1: Hierarchical regression analysis

A hierarchical regression analysis was used to identify and describe the relationship between generational cohorts, positive coping and retention factors (research aim 2). A hierarchical regression analysis was applied to test research hypothesis 2 (H2):

H2	Differences exist among generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels).

According to Hair et al. (2010), hierarchical regression is a strategy for determining how a variable impacts or "moderates" the nature of a connection between the dependent and independent variables empirically.

Step 2: Testing for significant mean differences

Testing for significant mean differences was necessary to determine the existence of differences in generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job level and qualification level). Tests for

significant mean differences were conducted to determine if the data presented considerable evidence in favour of the research hypothesis 2 (H2):

H2	Differences exist among generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels).

The Kruskal-Wallis test is a non-parametric statistical approach, and assesses the differences among three or more sample groups, being also referred to as a one-way AVOVA. The Kruskal-Wallis test was conducted to evaluate the research hypotheses, as the test compares the differences to the average rankings to see if they are likely to have come from same population. The Mann-Whitney test was also conducted to compare the differences of the groups by estimating the differences in ranks among the groups.

4.10 LEVEL OF SIGNIFICANCE

According to Field (2013), in testing the level of significance, two types of errors could occur. The 1st type of error is when the researcher rejects the null hypothesis, which suggests that there is a relationship between the variables while no relationship exists. The 2nd type of error happens when the researcher accepts a null hypothesis, which suggests that a relationship does exist between the variables despite there is being no relationship between the variables (Cohen et al., 2017). To test the hypothesis, a commonly used significant level of $p \leq .05$ is used, as it gives a 95% level of certainty that the results of the research may be acceptable and could be applied in other studies (Cohen et al., 2017).

4.10.1 Level of significance: correlation analysis

Cohen et al. (2017) stated that the effect size is considered when determining whether a result is applicable in the real world. As a result, the effect size is determined when assessing practical relevance. The Pearson Product Moment Correlation Coefficient (r) is frequently used to estimate effect size, with $r \leq .29$ indicating a modest practical affect at $p<.05$, $r \geq .30 \leq .49$ indicating a medium practical effect at $p<.05$ and $r \geq .50$ indicating a high practical effect at $p<.05$. The significance thresholds of $p \leq .05$ and $r \geq .30$ (medium practical effect size) were chosen as the limit for rejecting the null hypotheses in this research (Cohen et al., 2017). Table 4.8 indicates the various levels of statistical significance.

Table 4.8

Levels of Statistical Significance of Spearman Correlations

Practical effect size	Significance at $p \leq .05$
Small effect	≥ .10 ≤ .29
Moderate effect	r ≥ .30 ≤ .49
Large effect	r ≥ .50

Source: Author's own work

4.10.2 Level of significance: hierarchical regression analysis

The ANOVA (Fp) was used to evaluate significance in terms of the hierarchical regression analysis, with a low Fp-value (.05) indicating that the null hypothesis is likely to be rejected. As a result, if a predictor value has a low Fp-value (p.05), this variable is likely to strongly predict the dependent variable. According to Hair et al. (2016), when the hierarchical regression is used, the modified R^2 value shows the degree to which the independent variable explains the variation in the dependent variable. The modified R^2 value constantly ranges between 0% and 100%, which indicates whether the model clarifies none (0%) or all (100%) of the response data discrepancy around its mean (Hair et al., 2016).

The R^2 value, on the other hand, has the drawback of increasing when more variables are included. This might lead to the false conclusion that a model with more variables had a better fit to the data simply as it had more relationships (Hair et al., 2010). To address this issue, the modified R2 is calculated, and the explanatory power of the associated models is evaluated with various numbers of predictors (Hair et al., 2010). To address this issue, the modified R^2 is calculated, and the explanatory power of the associated models is evaluated with various numbers of predictors. As a result, Hair et al., (2010) found that the adjusted R^2 is a non-biased estimate of the R^2 value that may be read similarly to the R-value. Table 4.9 shows the different practical effect sizes of the adjusted R^2 cut-off values at Fp ≤ (.05) (Cohen et al., 2017).

Table 4.9

Levels of Statistical Significance of Hierarchical Regression

Practical effect size	Significance at $p \leq .05$
Small effect	$R^2 \geq .02 \leq .12$
Moderate effect	$R^2 \geq .13 \leq .25$
Large effect	$R^2 \geq .26$

Source: Author's own work

4.10.3 Level of significance: tests for significant mean differences

The tests of mean differences are significant and valid when the significance threshold is $p \leq$ (.05) Cohen's *d* is used to assess the magnitude of the influence of the mean differences. In Table 4.10, the practical impact sizes of Cohen's *d* are indicated (Cohen et al., 2017).

Table 4.10

Levels of Statistical Significance of Cohen's d

Practical effect size	Significance at $p \leq .05$
Small effect	$d = .02$
Medium effect	$d = .05$
Large effect	$d = .08$

Source: Author's own work

4.11 LIMITATIONS OF THE RESEARCH DESIGN

The research design led to several limitations as a result the limitations were considered in the interpretation of the findings of the study:

- The associations between the variables were interpreted in an exploratory rather than definitive manner due to the cross-sectional nature of the study.
- The influence of the demographic variables on generational cohorts, positive coping and retention factors.
- By using Coetzee and Potgieter (2019) short version the Positive Coping Behavioural Inventory (PCBI) was limited to the following coping behaviour: conative (motivational), affective (emotional), cognitive and interpersonal (social).

- The research was confined to the following categories using Döckel's (2003) Retention Factor Measure Scale: salary, job characteristics, training and development opportunities, supervisor support, career options, and work/life balance.
- The use of self-reporting tools has a number of limitations, including the possibility that some participants misread ambiguous language and that responses were completely subjective and not necessarily genuine.
- The findings of this research cannot be generalised to the consulting engineering population in South Africa as the response sample size (*N*=151) is relatively low. Had the sample size been greater the findings would have value in influencing in retention practices across many consulting engineering companies across South Africa.

4.12 CHAPTER SUMMARY

This chapter focused on the study's empirical examination, with the goal of defining the statistical methodologies that were utilised to explore generational cohorts, positive coping, and retention factors within the South African engineering industry. The psychometric battery's sample, selection, motivation, delivery, and scoring were all reviewed. The chapter finishes with a description of the phases involved in statistical data processing and the formation of research hypotheses.

Chapter 5 addresses the following aims of the research:

Research aim 1: To conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature.

Research aim 2: To identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs.

Research aim 3: To conceptualise the effect of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

CHAPTER 5: RESEARCH RESULTS

5.1 INTRODUCTION

The statistical findings of the empirical investigation are presented in this chapter using preliminary statistical analysis, descriptive statistics, correlations, and inferential statistics. The statistical data throughout this chapter is presented through tables and figures. In the discussion portion of this chapter, the empirical results are combined and discussed.

5.2 STAGE 1: PRELIMINARY STATISTICAL ANALYSIS

The data was subjected to preliminary statistical analysis in order to assess the construct validity and reliability of the measurement scales.

5.2.1 Step 1: Reporting of internal consistency reliability

The Cronbach's alpha coefficient was used in this investigation to determine the Positive Coping Behaviour Inventory (PCBI) and Retention Factor Measurement Scale's (RFMS) reliability. This was convenient as it measured the constructs in one test. The Cronbach's alpha coefficient is a number that runs from (0) to (1), with (1) denoting perfect consistency (Newton & Stuart, 2014). As a result, the item or test with a higher alpha coefficient is more trustworthy. In exploratory research, a Cronbach's alpha value of (.70) is considered a good reliability coefficient; however, it may drop to .60 (Newton & Stuart, 2014). Kannangara et al. (2020) found that the relationship between all the results from all the scale items makes up a measure, and internal consistency reliability can be calculated and expressed as Cronbach's Alpha.

5.2.1.1 Reporting on scale reliability: Positive Coping Behaviour Inventory (PCBI)

Table 5.1 indicates the Cronbach's alpha coefficient for each of the four subscales of the PCBI. The Cronbach's alpha coefficient scores varied from (.92) to (.67) for the total sample of (*N*= 151). The overall PCBI scale obtained a Cronbach's alpha coefficient of (.93), which deemed sufficient for the current research.

Table 5.1

Internal Consistency Reliability: PCBI

Subscale	Cronbach's alpha	Number of items
Conative Coping Behaviour	.77	4
Affective Coping Behaviour	.83	5
Cognitive Coping Behaviour	.92	10
Interpersonal Coping Behaviour	.67	5
Overall PCBI scale	.93	24

Source: Author's own work

5.2.1.2 Reporting on scale reliability: Retention Factor Measurement Scale (RFMS)

Table 5.2 indicates the Cronbach's alpha coefficient for each of the six subscales of the RFMS. The Cronbach's alpha coefficient scores varied from (.93) to (.88) for the total sample of (*N*=151). The overall PCBI scale obtained a Cronbach's alpha coefficient of (.82), which deemed sufficient for the current research.

Table 5.2

Internal Consistency Reliability: RFMS

Subscale	Cronbach's alpha	Number of items
Compensation	.86	3
Training & Development	.93	4
Career Opportunities	.92	3
Work/Life Balance	.88	4
Overall RFMS scale	.82	20

Source: Author's own work

5.3 STAGE 2: DESCRIPTIVE STATISTICAL ANALYSIS

The importance of descriptive statistical analysis in capturing trends, patterns, and observable characteristics of a sample is crucial (Hillier, 2021). Descriptive statistics were used to analyse the data by carefully summarising it and highlighting the most important numerical results so that they could be clearly comprehended (Kaur et al., 2018). The first phase was to calculate the means (M) and standard deviations (SD), as well as kurtosis, skewness, and frequency, and the second was to test for assumptions.

5.3.1 Step 1: Reporting on Testing for assumptions

In general, research aims to draw valid conclusions from a population's sample of data. Unfortunately, when population samples are utilised to offer accurate numbers that are applicable to the entire population, difficulties might arise. As a result, in the current study, statistical approaches were utilised to assess the extent to which particular judgments about the research findings may be drawn. The following assumptions underpin the multivariate techniques and tests for significant mean differences utilised in this study:

(a) The accuracy of data entered into the data file and missing values
Only questionnaires with all fields filled in were accepted. The data was judged to be within the probable range of values for all of the elements, indicating that it was suitable for further examination. The minimum and maximum values, as well as the averages and standard deviations, were verified to guarantee data correctness.

(b) The ratio of cases to independent variables
The sample size in this study (N=151) was deemed suitable for achieving acceptable statistical power. This was necessary for the correlation and regression analysis to determine the impacts.

5.4.1 Step 2: Reporting of means, standard deviations, skewness and kurtosis

After determining the internal consistency reliability of the two measures, a descriptive analysis was done to examine the distribution of the scores. The means (M), standard deviations (SD), skewness, and kurtosis for each scale were determined, and the results are shown below with a brief explanation. The mean score is calculated by dividing the total number of confirmed values by the total number of values in the group, with the resultant mathematical average being the mean score (Dahlan, 2021). The standard deviation, according to Salkind (2018), is a measurement of the spread of data distribution, it quantifies the departure from the mean, and it is vitally important in statistics to reveal a central tendency. Measures of central tendency are mean, mode and median.

When the data in a sample group is parallel on both sides, the center point is termed symmetrical, according to Salkind (2018). The skewness of a score distribution refers to how far it deviates from the center point. A standard distribution has no skewness, and any symmetric data should have a skewness close to zero. Positive skewness values indicate data that is tilted right, whereas negative skewness values indicate data that is slanted left (Frey,

2018). Kurtosis, according to Field (2013), is a measure of the degree to which scores cluster in the tails of a frequency distribution. In data sets with a high kurtosis, heavy tails or outliers are more prevalent. Light tails and a lack of outliers are common in data sets with low kurtosis (Salkind, 2018).

5.4.1.1 Positive Coping Behaviour Inventory (PCBI)

The PCBI scores were determined by calculating the mean scores for all the items relating to the subscales of conative (motivational) coping behaviour had 4 statements, affective (emotional) coping behaviour had 5 statements, cognitive coping behaviour had 10 statements and interpersonal (social) consisted of 5 statements. The participants had to answer a 5-point Likert-type scale where 1 indicated not strong and 5 indicated strongest coping behaviour they tapped into. The subscale with the highest mean scores was disclosed by the score provided to a statement, indicating which positive coping behaviour subscale participants use the most.

Table 5.3 summarises the means, standard deviations, skewness and kurtosis of each of the four subscales of the PCBI, as well as of the overall scale. The means of the four subscales ranged between (*M*= 3.17) and (*M*= 3.78). The cognitive coping behaviour subscale was the highest mean score of (*M* = 3.78) and (*SD* = .61), while the lowest mean score was obtained for the interpersonal coping behaviour subscale which was (*M* = 3.17) and (*SD* = .63). The skewness for the four subscales ranged between (-.17) and (-92), which falls within the (-1) and (1) normality range recommended for these coefficients (Salkind, 2018). The skewness values indicated that all the scores for the subscales were negatively slanted to the left (Frey, 2018). The kurtosis values varied from (.46) to (2.58). Non-parametric statistics were utilised since the data was not normally distributed. The distribution is called a leptokurtic distribution because the kurtosis values are larger than zero, resulting in heavier tails (Salkind, 2018).

Table 5.3

Means, Standard Deviations, Skewness and Kurtosis: PCBI

Subscale	Mean	Std. Deviation	Skewness	Kurtosis
Conative Coping Behaviour	3.67	.59	-.80	2.58
Affective Coping Behaviour	3.41	.72	-.39	.46
Cognitive Coping Behaviour	3.78	.61	-.64	2.08
Interpersonal Coping Behaviour	3.17	.63	-.17	.86
Overall PCBI scale	3.56	.54	-.92	2.87

Source: Author's own work

5.4.1.2 Retention Factor Measurement Scale (RFMS)

Table 5.4 summarises the means, standard deviations, skewness and kurtosis of each of the six subscales of the RFMS, as well as of the overall scale. The means for the six sub-scales ranged between (*M* = 3.35) and (*M* = 4.61). The job characteristics subscale was the highest mean score of (*M* = 4.61) and (*SD* = 4.66), while the lowest mean score was obtained for a work/life balance subscale which was (*M* = 3.35) and (*SD* = 3.25). The skewness for the six subscales ranged between (.75) and (1.38), which indicated that all the scores for the subscales were positively slanted to the right (Frey, 2018). The kurtosis values ranged between (-.70) and (.42), thereby falling within the (-1) and (1) normality range (Salkind, 2018).

Table 5.4

Means, Standard Deviations, Skewness and Kurtosis: RFMS

Subscale	Mean	Std. Deviation	Skewness	Kurtosis
Compensation	4.17	4.33	1.13	-.70
Job Characteristics	4.61	4.66	.75	.17
Training & Development	3.75	4.00	1.32	-.37
Supervisor Support	3.89	3.66	1.00	.42
Career Opportunities	3.60	4.00	1.38	-.37
Work/Life Balance	3.35	3.25	1.22	.26
Overall RFMS scale	.66	.39	.39	.66

Source: Author's own work

In summary, the PCBI scale had four subscales with the cognitive coping behaviour subscale scoring the highest mean score of (*M* = 3.78) and (*SD* = .61), while the lowest mean score was obtained for the interpersonal coping behaviour subscale which was (*M* = 3.17) and (*SD* = .63). The RFMS had six subscales and the job characteristics subscale scored the highest mean score of (*M* = 4.61) and (*SD* = 4.66) and work/life balance reported the lowest mean score of (*M* = 3.35).

5.4 STAGE 3: CORRELATIONAL ANALYSIS

This section shows the relationships between demographical factors and two measuring scales, the Positive Coping Behaviour Inventory (PCBI) and the Retention Factor Measurement Scale (RFMS). In order to determine the implications of retention factor practices, correlation analysis was used to conduct an empirical investigation into the statistical association between generational cohorts, positive coping, and retention factors in a sample

of engineers employed in the South African engineering sector (research aim 1). They were also utilised to see if the data supported study hypothesis 1 (H1), which states that generational cohorts, positive coping, and retention factors have a substantial and positive relationship.

The data was not distributed normally therefore non-parametric test were used. As some of the variables were outside the normal distribution range of (-1) and (1) therefore, non-parametric test, spearman tests, Mann Whitney and Kruskall Wallis tests were performed. A Spearman rank correlation was applied to test research hypothesis. The Spearman rank-order correlation coefficient (also known as Spearman's correlation) is a nonparametric measure of the degree and direction of connection between two variables evaluated on at least an ordinal scale (Butler & Graff, 2021). A Spearman correlation was used to assess and describe the nature of the relationships between the variables. The Spearman correlation assesses the degree of connection between the variables and makes no assumptions about the frequency distribution of the variables. The fact that some of the variables were outside the normal distribution range of (-1), (1) the non-parametric tests spearman tests, Mann Whitney, and the Kruskall Wallis tests were performed. Table 5.5 provides a summary of the correlations between the demographic variables, PCBI and RFMS.

5.4.1 Correlation of demographical variables and PCBI

This section reports on the correlations between the demographical variables and PCBI variables. As shown in Table 5.5 a number of significant relationships were observed between these variables, with several significant relationships being found between demographical variables and PCBI.

Age showed no significant positive relationship with conative coping, affective coping, cognitive coping or social coping.

Gender showed no significant positive relationship with conative coping, affective coping, cognitive coping or social coping.

Race showed significant positive relationship with conative coping. There were no other statistically significant relationships found affective coping, cognitive coping or social coping.

- Conative coping (r = .09; small practical effect size, $p \leq .05$).

Job Level showed significant positive relationship with conative coping. There were no other statistically significant relationships found affective coping, cognitive coping or social coping.

- Conative coping (r = .10; small practical effect size, p ≤ .05).

Job Qualification showed significant positive relationship with conative coping. There were no other statistically significant relationships found affective coping, cognitive coping or social coping behaviour.

- Conative coping (r = .13; small practical effect size, p ≤ .05).

5.4.2 Correlation of demographical variables and RFMS

This section reports on the correlations between the demographical variables and RFMS variables. As shown in Table 5.5 a number of significant relationships were observed between these variables, with several significant relationships being found between demographical variables and RFMS.

Age showed significant positive relationship with compensation and a relationship with training and development. There were no statistically significant relationships found between career opportunities and work/life balance.

- Compensation (r =.16; small practical effect size, p ≤ .05).
- Training and Development Opportunities (r = .11; small practical effect size, p ≤ .05).

Gender showed significant positive relationships with training and development and a relationship was found with work/life balance. There were no other statistically significant relationships found between compensation and career opportunities.

- Training and Development Opportunities (r =.08; small practical effect size, p ≤ .05).
- Work/Life Balance (r = .02; small practical effect size, p ≤ .05).

Race showed significant positive relationship with compensation and a relationship was found with career opportunities. There were no other statistically significant relationships found between training and development opportunities and work/life balance.

- Compensation (r = .24; small practical effect size, p ≤ .05).
- Career opportunities (r = .06; small practical effect size, p ≤ .05).

Job Level showed significant positive relationship with only compensation. There were no other statistically significant relationships found between the other variables.

- Compensation (r = .12; small practical effect size, p ≤ .05).

Job Qualification showed significant positive relationships compensation. There were no other statistically significant relationships found between the other variables.

- Compensation (r =.06; small practical effect size, p ≤ .05).

Table 5.5

Spearman's Rank Correlational analysis of Demographical Variables, PCBI and RFMS

Variables	Age	Gender	Race	Job Level	Job Qualification	Overall PCBI	Conative Coping	Affective Coping	Cognitive Coping	Social Coping	Overall RFMS	Compensation	Training and Development	Career Opportunities	Work/Life Balance
Age	--														
Gender	-.10	--													
Race	**.27****	**-.24****	--												
Job Level	**.37****	-.12	**.27****	--											
Job Qualification	.02	.09	.00	**.28****	--										
Overall PCBI	-.11	-.01	-.06	.03	.10	--									
Conative Coping	-.05	-.02	.09	.10	.13	**.76****	--								
Affective Coping	-.03	-.07	-.14	-.18	.00	**.78****	**.59****	--							
Cognitive Coping	-.09	.00	-.06	.08	.11	**.89****	**.61****	**.57****	--						
Social Coping	-.09	-.01	.00	-.05	.08	**.74****	**.49****	**.56****	**.56****	--					
Overall RFMS	.01	.06	.07	.01	.05	.08	.05	.13	.05	.03	--				
Compensation	**.16***	**-.16***	**.24***	.12	.06	.06	-.02	.08	.03	.08	**.58****	--			
Training & Development	.11	.08	-.07	.01	-.00	.14	.04	**.18***	.11	.10	**.77****	**.35****	--		
Career Opportunities	.00	-.02	.06	-.05	-.03	.10	.04	.15	.06	.07	**77****	**.44****	**.77****	--	
Work/Life Balance	-.09	.02	.00	-.09	.03	-.10	-.04	-.07	-.08	-.13	**.21****	-.06	-.13	-.15	--

Notes: (*N* = 151), *** p ≤ .001; ** p ≤ .01; * p ≤ .05. r ≤ .30 (small practical effect size), r ≥ .30 ≤ .49 (medium practical effect size), r ≥ .50 (large practical size)

Table 5.5 shows a relationship between demographical variables, PCBI and RFMS variables does exist. Correlations between demographical variables and PCBI shows that associations were only significant for conative coping behaviour ranging between (*r* = .09) to (*r* =.13). However, there were no significant relationship found between affective coping, cognitive coping or social coping behaviour.

Correlations between demographical variables and RFMS shows that associations were significant for compensation ranging between (r = .06) to (r =.24). There was no significant relationship found between training and development, career opportunities and work/life balance. The correlation coefficient (see Table 5.5) showed a small to large practical effect, the highest value being (.24) and this is barely above the level of multicollinearity concern.

The correlation analysis revealed data partially supported the research hypothesis 1 (*H1): There is a significant and positive relationship between generational cohorts, positive coping and retention factors.*

5.5 STAGE 4: INFERENTIAL ANALYSIS

Inferential statistics was used to makes generalisations about the larger population (Upadhyay, 2021). This stage consisted of two steps, the first step was the hierarchical regression analysis and in the second step testing for significant mean differences was conducted.

5.5.1 Step 1: Hierarchical Regression Analysis

A hierarchical regression analysis was used to determine if a relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs does exist (research aim 2) and was applied to test research hypothesis 2 *(H2): Differences exist among generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels).* The generational cohorts and positive coping construct were studied using hierarchical regression analysis, with the independent variables being the generational cohorts and the retention factors construct being the dependent variable. Hierarchical regression is a statistical method for identifying predictive variables that combines regression models with an automated technique. The researcher employed a backward elimination approach, which involved starting with all of the variables and analysing their statistical significance one by one before

discarding those that were not significant. Table 5.6 summarises the results of the hierarchical regression analysis.

Table 5.6

Results of the Hierarchical Regression Analysis: Generational Cohorts and PCBI as Independent Variables and RFMS a Dependent Variable

Model variables	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics		Model Info			
	B.	Std. Error	Beta			Tolerance	VIF	F	R	R^2	Adjusted R^2
Constant	3.21	.27		11.62	.00						
Affective Coping	.19	.08	.21	2.49	.01	1.00	1.00	6.22	.21	.04	.03
Baby Boomers (1943 – 1960)			.06	.80	.42	1.00	1.00				
Generation X (1961 – 1980)			-.00	-.06	.95	.99	1.00				
Generation Y (1981 – 1993)			-.05	-.58	.56	.99	1.00				

Notes: N = 195; *** p ≤ .001; ** p ≤ .01; * p ≤ .05.

The results of the Hierarchical regression analysis (Table 5.6) indicate that affective coping is the only significant predictor variable and report the standardised and unstandardised coefficients for the significant variable only. It must be noted that generational cohorts were excluded variables in the models as they are not significant predictors, the unstandardised coefficients also not being provided, as the results indicated adequate supportive evidence for research hypothesis 2 *(H2): Differences exist among generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels).* Generational cohorts are not a predictor on retention factors, although the results did reveal that only affective positive coping is a significant predictor on retention factors.

5.5.2 Step 2: Testing for significant mean differences

Testing for significant mean differences was necessary to determine the existence of variations in generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job level and qualification level). Tests for significant mean differences were conducted to determine if the data presented considerable evidence in favour of the research hypothesis 2 *(H2): Differences exist among generational*

cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels).

The Mann-Whitney U test was conducted to test for significant mean difference regarding the variables of generational cohorts, positive coping and retention factors. Table 5.7 displays the results for the Mann-Whitney U test scores relating to gender groups.

Table 5.7

Mann-Whitney U Test Scores for Gender (N = 151)

Variable	Group	N	Means	SD	Mean rank	Mann-Whitney U value	Standardized Test Statistic	Sig.
Conative	Male	135	3.68	.57	76.38	1029.00	-.31	.76
	Female	16	3.59	.78	72.81			
Affective	Male	135	3.42	.72	77.17	922.00	-.96	.34
	Female	16	3.26	.71	66.13			
Cognitive	Male	135	3.78	.60	75.96	1085.50	.03	.97
	Female	16	3.76	.77	76.34			
Interpersonal Coping	Male	135	3.19	.59	76.17	1057.00	-.14	.89
	Female	16	3.05	.88	74.56			
Overall PCBI	Male	135	3.57	.52	76.18	1056.00	-.14	.87
	Female	16	3.48	.69	74.50			
Compensation	Male	135	4.23	1.11	78.39	757.00	-1.96	.05
	Female	16	3.66	1.18	55.81			
Training and Development	Male	135	3.71	1.30	74.67	1260.00	1.09	.28
	Female	16	4.06	1.47	87.25			
Career Opportunities	Male	135	3.60	1.41	76.33	1035.50	-.27	.78
	Female	16	3.56	1.18	73.22			
Work/Life Balance	Male	135	3.35	1.19	75.61	1132.00	.31	.75
	Female	16	3.42	1.50	79.25			
Overall RFMS	Male	135	3.85	.68	75.03	1211.00	.79	.43
	Female	16	3.93	.45	84.19			

Notes: N = 135; *** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$.

The results of the Mann-Whitney U test scores for gender (Table 5.7) indicate that there was no statistically significant difference between the different gender groups, positive coping and retention factors. A significant difference was only found between gender groups and compensation.

Table 5.8 displays the results for the Kruskal-Wallis test scores relating to race.

Table 5.8

Kruskal-Wallis Test Scores for Race (N = 148)

Variable	Group	N	Means	SD	Mean Rank	Chi-Square	df	Sig.
Conative	Black African	30	3.67	.75	71.92	3.57	3	.31
	Coloured	4	3.18	.71	42.63			
	Indian/Asian	13	3.48	.71	65.27			
	White	101	3.71	.51	77.72			
Affective	Black African	30	3.58	.77	84.82	6.80	3	.07
	Coloured	4	2.95	.75	47.13			
	Indian/Asian	13	3.67	.81	92.69			
	White	101	3.33	.66	70.18			
Cognitive	Black African	30	3.87	.81	81.77	1.13	3	.76
	Coloured	4	3.57	.78	71.38			
	Indian/Asian	13	3.70	.60	70.23			
	White	101	3.77	.55	73.01			
Interpersonal Coping	Black African	30	3.23	.73	80.57	4.44	3	.21
	Coloured	4	2.10	.93	36.50			
	Indian/Asian	13	3.04	.53	65.31			
	White	101	3.21	.59	75.39			
Overall PCBI	Black African	30	3.64	.67	83.47	3.11	3	.37
	Coloured	4	3.13	.70	46.88			
	Indian/Asian	13	3.52	.59	74.50			
	White	101	3.55	.48	72.93			
Compensation	Black African	30	3.49	1.2	49.95	13.39	3	.00
	Coloured	4	4.08	.87	64.00			
	Indian/Asian	13	4.53	1.06	87.08			
	White	101	4.34	1.03	80.59			
Training and Development	Black African	30	3.83	1.41	79.02	1.62	3	.65
	Coloured	4	4.31	1.21	96.38			
	Indian/Asian	13	3.63	1.72	73.12			
	White	101	3.71	1.26	72.47			
Career Opportunities	Black African	30	3.61	1.35	74.47	2.47	3	.47
	Coloured	4	2.83	1.83	53.75			
	Indian/Asian	13	3.10	1.75	61.58			
	White	101	3.70	1.33	77.00			
Work/Life Balance	Black African	30	3.25	1.08	72.17	.46	3	.92
	Coloured	4	3.43	1.43	75.63			
	Indian/Asian	13	3.55	1.65	81.73			
	White	101	3.34	1.21	74.22			
Overall RFMS	Black African	30	3.71	.69	67.95	1.01	3	.79
	Coloured	4	3.95	.85	79.75			
	Indian/Asian	13	3.89	.86	72.35			
	White	101	3.85	.62	76.51			

Notes: N = 135; *** p ≤ .001; ** p ≤ .01; * p ≤ .05.

The results of the Kruskal-Wallis test scores relating to race (Table 5.8) indicate that there no statistically significant differences between the different race groups (Black, Coloured. Indian and White) with respect to positive coping and retention factors. The only significance was found between race groups and compensation.

Table 5.9 displays the results for the Kruskal-Wallis test relating to generational cohorts.

Table 5.9 displays the results for the Kruskal-Wallis test relating to generational cohorts, the results test scores for generational cohorts (Table 5.9) indicating that there were no statistically significant differences between generational cohorts (Baby Boomers, Generation X, Generation Y and Generation Z) and positive coping or retention factors. A statistically significant difference was found between generational cohorts and career opportunities.

Table 5.9

Kruskal-Wallis Test on Generational Cohorts (N = 151)

Variable	Group	N	Means	SD	Mean Rank	Chi-Square	df	Sig.
Conative	1943 – 1960 (Baby Boomers)	11	3.63	.40	69.23	5.61	3	.13
	1961 – 1980 (Generation X)	72	3.58	.55	69.78			
	1981 – 1993 (Generation Y)	62	3.81	.63	85.81			
	Born after 1994 (Generation Z)	6	3.37	.81	61.67			
Affective	1943 – 1960 (Baby Boomers)	11	3.38	.51	71.64	1.49	3	.68
	1961 – 1980 (Generation X)	72	3.36	.75	74.24			
	1981 – 1993 (Generation Y)	62	3.44	.71	76.90			
	Born after 1994 (Generation Z)	6	3.76	.86	95.75			
Cognitive	1943 – 1960 (Baby Boomers)	11	3.43	.43	48.41	7.28	3	.06
	1961 – 1980 (Generation X)	72	3.77	.54	74.94			
	1981 – 1993 (Generation Y)	62	3.83	.69	79.41			
	Born after 1994 (Generation Z)	6	4.15	.68	104.00			

Interpersonal Coping	1943 – 1960 (Baby Boomers)	11	3.00	.47	61.09	2.73	3	.43
	1961 – 1980 (Generation X)	72	3.15	.64	75.05			
	1981 – 1993 (Generation Y)	62	3.25	.64	81.05			
	Born after 1994 (Generation Z)	6	2.96	.66	62.58			
Overall PCBI	1943 – 1960 (Baby Boomers)	11	3.36	.34	54.32	4.43	3	.39
	1961 – 1980 (Generation X)	72	3.5	.51	73.53			
	1981 – 1993 (Generation Y)	62	3.62	.57	81.45			
	Born after 1994 (Generation Z)	6	3.69	.66	89.08			
Compensation	1943 – 1960 (Baby Boomers)	11	4.54	1.27	92.64	3.50	3	.32
	1961 – 1980 (Generation X)	72	4.29	1.00	79.64			
	1981 – 1993 (Generation Y)	62	4.01	1.19	70.13			
	Born after 1994 (Generation Z)	6	3.72	1.56	65.83			
Training and Development Opportunities	1943 – 1960 (Baby Boomers)	11	4.15	1.30	90.82	4.33	3	.22
	1961 – 1980 (Generation X)	72	3.81	1.40	78.38			
	1981 – 1993 (Generation Y)	62	3.55	1.21	68.77			
	Born after 1994 (Generation Z)	6	4.33	1.35	95.08			
Career Opportunities	1943 – 1960 (Baby Boomers)	11	4.45	.94	102.77	8.57	3	.03
	1961 – 1980 (Generation X)	72	3.36	1.44	68.77			
	1981 – 1993 (Generation Y)	62	3.65	1.32	76.98			
	Born after 1994 (Generation Z)	6	4.44	1.31	103.58			
Work/Life Balance	1943 – 1960 (Baby Boomers)	11	3.25	1.58	67.68	.82	3	.84
	1961 – 1980 (Generation X)	72	3.34	1.22	74.92			
	1981 – 1993 (Generation Y)	62	3.41	1.12	79.14			

	Born after 1994 (Generation Z)	6	3.20	1.70	71.75			
Overall RFMS	1943 – 1960 (Baby Boomers)	11	4.04	.52	89.91	2.99	3	.39
	1961 – 1980 (Generation X)	72	3.84	.72	73.15			
	1981 – 1993 (Generation Y)	62	3.82	.62	74.72			
	Born after 1994 (Generation Z)	6	4.12	.55	98.00			

Notes: N = 135; *** p ≤ .001; ** p ≤ .01; * p ≤ .05.

Table 5.10 displays the results for the Kruskal-Wallis test relating to job level.

Table 5.10

Kruskal-Wallis Test on Job Level (N = 130)

Variable	Group	N	Mean	SD	Mean Rank	Chi-Square	df	Sig.
Conative Coping	Graduate	5	3.75	.53	70.40	2.07	2	.35
	Candidate Engineer	20	3.57	.91	63.95			
	Candidate engineering Technologist	9	3.44	.56	46.39			
	Candidate Certificated Engineer	3	3.41	.38	42.00			
	Candidate engineering Technician	2	3.75	.35	68.50			
	Professional Engineering Technician	5	3.75	.25	68.40			
	Professional Certificated Engineer	9	3.83	.54	76.72			
	Professional Engineering Technologist	20	3.56	.51	55.50			
	Professional Engineer	57	3.74	.58	71.25			
Affective Coping	Graduate	5	3.48	.71	63.60	.01	2	.99
	Candidate Engineer	20	3.36	.92	65.10			
	Candidate engineering Technologist	9	3.42	.52	64.89			

	Candidate Certificated Engineer	3	3.33	.30	56.33			
	Candidate engineering Technician	2	3.80	.00	93.00			
	Professional engineering Technician	5	3.84	.45	91.10			
	Professional Certificated Engineer	9	3.62	.54	72.33			
	Professional Engineering Technologist	20	3.19	.77	55.78			
	Professional Engineer	57	3.38	.75	65.51			
Cognitive Coping	Graduate	5	3.72	.51	60.30	.20	2	.90
	Candidate Engineer	20	3.73	.91	67.95			
	Candidate engineering Technologist	9	3.64	.46	57.72			
	Candidate Certificated Engineer	3	3.43	.15	31.50			
	Candidate engineering Technician	2	4.25	.35	99.75			
	Professional Engineering Technician	5	3.82	.43	63.80			
	Professional Certificated Engineer	9	3.91	.35	73.11			
	Professional engineering Technologist	20	3.51	.59	49.50			
	Professional Engineer	57	3.90	.59	71.47			
Interpersonal Coping	Graduate	5	3.32	.46	73.40	.29	2	.86
	Candidate Engineer	20	3.12	.76	67.18			
	Candidate engineering Technologist	9	3.15	.71	60.50			
	Candidate Certificated Engineer	3	3.06	.64	56.83			
	Candidate engineering Technician	2	3.70	.42	102.25			

	Professional Engineering Technician	5	3.16	.69	68.30			
	Professional Certificated Engineer	9	3.35	.34	77.67			
	Professional Engineering Technologist	20	3.11	.79	61.15			
	Professional Engineer	57	3.17	.58	63.54			
Overall PCBI scale	Graduate	5	3.59	.45	65.90	.10	2	.94
	Candidate Engineer	20	3.50	.81	66.63			
	Candidate engineering Technologist	9	3.46	.44	57.17			
	Candidate Certificated Engineer	3	3.33	.19	38.50			
	Candidate engineering Technician	2	3.95	.17	101.75			
	Professional Engineering Technician	5	6.67	.11	72.70			
	Professional Certificated Engineer	9	3.72	.35	75.67			
	Professional Engineering Technologist	20	3.45	.57	53.38			
	Professional Engineer	57	3.61	.50	68.55			
Compensation	Graduate	5	3.86	.60	47.20	2.41	2	.29
	Candidate Engineer	20	3.68	1.48	53.58			
	Candidate engineering Technologist	9	4.18	1.29	66.06			
	Candidate Certificated Engineer	3	4.33	1.45	74.17			
	Candidate Engineering Technician	2	4.83	1.64	81.00			
	Professional Engineering Technician	5	3.93	.64	48.60			
	Professional Certificated Engineer	9	4.62	1.32	82.22			

	Professional Engineering Technologist	50	4.35	.86	67.93			
	Professional Engineer	57	4.29	1.02	68.19			
Training & Development	Graduate	5	4.50	1.00	83.80	1.77	2	.41
	Candidate Engineer	20	3.71	1.47	66.93			
	Candidate engineering Technologist	9	2.92	1.25	43.61			
	Candidate Certificated Engineer	3	2.33	1.52	29.83			
	Candidate engineering Technician	2	5.62	.17	122.00			
	Professional Engineering Technician	5	2.45	.75	28.10			
	Professional Certificated Engineer	9	4.58	1.19	90.11			
	Professional Engineering Technologist	20	3.67	1.49	65.75			
	Professional Engineer	57	3.79	1.18	66.05			
Career Opportunities	Graduate	5	3.53	.93	66.60	1.10	2	.57
	Candidate Engineer	20	3.95	1.70	77.03			
	Candidate engineering Technologist	9	3.07	1.69	54.06			
	Candidate Certificated Engineer	3	3.33	1.15	55.33			
	Candidate engineering Technician	2	5.16	.23	114.25			
	Professional Engineering Technician	5	2.80	.93	43.60			
	Professional Certificated Engineer	9	4.33	1.00	84.17			
	Professional Engineering Technologist	20	3.18	1.63	56.55			
	Professional Engineer	57	3.56	1.27	64.63			
	Graduate	3.20	1.57	3.20	61.70	.13	2	.93

Work/Life Balance	Candidate Engineer	3.50	1.21	3.50	69.45			
	Candidate engineering Technologist	3.05	1.32	3.05	52.72			
	Candidate Certificated Engineer	3.08	.38	3.08	55.83			
	Candidate engineering Technician	6.62	.88	6.62	74.00			
	Professional Engineering Technician	4.00	.72	4.00	85.00			
	Professional Certificated Engineer	4.02	1.35	4.02	82.44			
	Professional Engineering Technologist	3.78	1.46	3.78	74.97			
	Professional Engineer	3.23	1.19	3.23	58.96			
Overall RFMS scale	Graduate	5	3.89	.51	70.40	.51	2	.77
	Candidate Engineer	20	3.86	.78	66.40			
	Candidate engineering Technologist	9	3.45	.66	42.83			
	Candidate Certificated Engineer	3	3.51	.79	51.83			
	Candidate engineering Technician	2	4.77	.53	114.50			
	Professional Engineering Technician	5	3.55	.46	46.00			
	Professional Certificated Engineer	9	4.37	.90	86.50			
	Professional Engineering Technologist	20	3.92	.68	66.78			
	Professional Engineer	57	3.88	.57	65.28			

Notes: N = 135; *** p ≤ .001; ** p ≤ .01; * p ≤ .05.

The results of the Kruskal-Wallis test scores for job level (Table 5.10) indicate that there was no statistically significant difference between the different job levels (Graduate, Candidate Engineer, Candidate Engineering Technologist, Candidate Certificated Engineer, Candidate Engineering Technician, Professional Engineering Technician, Professional Certificated

Engineer, Professional Engineering Technologist and Professional Engineer) positive coping and retention factors.

Table 5.11 displays the results for the Kruskal-Wallis test relating to qualification level.

Table 5.11

Kruskal-Wallis Test on Qualification Level (N = 151)

Variable	Group	N	Mean	SD	Mean Rank	Chi-Square	df	Sig.
Conative Coping	Grade 12 (NQF level 4)	2	3.00	.00	17.00	5.13	2	.07
	Diploma or Advanced Certificate (NQF 6)	13	3.63	.54	64.73			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.63	.59	73.16			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.78	.59	82.79			
	Master's Degree (NQF 9)	28	3.68	.67	77.95			
	Doctoral Degree (NQF 10)	1	3.75	-	80.00			
Affective Coping	Grade 12 (NQF level 4)	2	2.70	.70	29.50	2.63	2	.26
	Diploma or Advanced Certificate (NQF 6)	13	3.49	.45	74.15			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.44	.68	77.36			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.30	.84	69.43			
	Master's Degree (NQF 9)	28	3.35	.77	73.75			
	Doctoral Degree (NQF 10)	1	4.00	-	122.50			
Cognitive Coping	Grade 12 (NQF level 4)	2	3.25	.21	28.00	2.46	2	.29
	Diploma or Advanced Certificate (NQF 6)	13	3.51	.56	52.46			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.81	.61	78.17			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.71	.63	70.79			
	Master's Degree (NQF 9)	28	3.90	.64	82.00			
	Doctoral Degree (NQF 10)	1	3.80	-	76.50			

Interpersonal Coping	Grade 12 (NQF level 4)	2	3.00	.00	54.50	.95	2	.62
	Diploma or Advanced Certificate (NQF 6)	13	2.96	.47	58.65			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.17	.68	75.18			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.24	.56	80.29			
	Master's Degree (NQF 9)	28	3.20	.69	76.18			
	Doctoral Degree (NQF 10)	1	3.00	-	54.50			
Overall PCBI scale	Grade 12 (NQF level 4)	2	3.04	.05	22.50	3.12	2	.20
	Diploma or Advanced Certificate (NQF 6)	13	3.41	.43	58.00			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.57	.54	76.93			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.54	.56	74.86			
	Master's Degree (NQF 9)	28	3.60	.56	78.57			
	Doctoral Degree (NQF 10)	1	3.66	-	86.00			
Compensation	Grade 12 (NQF level 4)	2	4.50	.70	86.50	1.16	2	.55
	Diploma or Advanced Certificate (NQF 6)	13	4.37	1.36	83.73			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	4.02	1.14	69.33			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	4.11	1.03	71.10			
	Master's Degree (NQF 9)	28	4.40	1.12	84.75			
	Doctoral Degree (NQF 10)	1	5.33	-	129.50			
Training & Development	Grade 12 (NQF level 4)	2	4.87	.17	114.25	.35	2	.36
	Diploma or Advanced Certificate (NQF 6)	13	3.78	1.62	78.65			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.64	1.42	71.39			
	Postgraduate Diploma or	29	3.92	1.24	78.14			

	Professional Qualification (NQF 8)							
	Master's Degree (NQF 9)	28	3.82	1.7	73.80			
	Doctoral Degree (NQF 10)	1	4.25	-	88.00			
Career Opportunities	Grade 12 (NQF level 4)	2	4.83	.23	116.25	2.02	2	.36
	Diploma or Advanced Certificate (NQF 6)		3.92	1.36	85.46			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.48	1.44	70.96			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.68	1.39	76.31			
	Master's Degree (NQF 9)	28	3.57	1.33	73.86			
	Doctoral Degree (NQF 10)	1	4.00	-	79.50			
Work/Life Balance	Grade 12 (NQF level 4)	2	1.87	.17	17.00	3.87	2	.14
	Diploma or Advanced Certificate (NQF 6)	13	3.82	1.11	91.73			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.25	1.19	70.91			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.43	1.29	76.57			
	Master's Degree (NQF 9)	28	3.39	1.20	75.52			
	Doctoral Degree (NQF 10)	1	6.00	-	146.50			
Overall RFMS scale	Grade 12 (NQF level 4)	2	3.92	.10	82.50	1.19	2	.55
	Diploma or Advanced Certificate (NQF 6)	13	4.05	.97	86.35			
	Bachelor's Degree or Advanced Certificate (NQF 7)	75	3.78	.68	68.74			
	Postgraduate Diploma or Professional Qualification (NQF 8)	29	3.87	.53	75.66			
	Master's Degree (NQF 9)	28	3.95	.60	80.34			
	Doctoral Degree (NQF 10)	1	5.10	-	139.50			

Notes: N = 135; *** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$.

The results of the Kruskal-Wallis test scores for job level (Table 5.11) indicate that there were no statistically significant differences between the different qualification levels (Grade 12, Diploma or Advanced Certificate, Bachelor's Degree or Advanced Certificate, Postgraduate Diploma or Professional Qualification, Master's Degree and a Doctoral Degree) positive coping and retention factors.

The results of the Mann-Whitney U test and Kruskal-Wallis tests provided partial supported evidence for the research hypothesis 3 *(H3): Differences do exist in generational cohorts, retention factors and positive coping in terms of demographical variables.*

5.6 SYNTHESIS, INTERPRETATION AND DISCUSSION

The biographical profile of the sample is discussed in this section, along with the findings of the tested research hypotheses.

5.6.1 Biographical profile of the sample

Within a South African context, the participants in the sample were predominantly white males that were born between 1961 and 1980 and fell into the Generation X cohort. With the most predominant job level in the sample being professional engineers and the majority of the participants had a bachelor's degree or an advanced certificate with an NQF level 7 qualification.

5.6.2 Sample profile: Positive Coping Behaviour and Retention Factors

The interpretation of the means is discussed in this section. Table 5.12 shows the highest and the lowest mean scores of the two measuring instruments.

Table 5.12

Summary of Means of Measuring Instruments

	PCBI	RFMS
Highest mean	Cognitive Coping Behaviour (3.78)	Job Characteristics (4.61)
Lowest mean	Interpersonal Coping Behaviour (3.17)	Work/Life Balance (3.35)

Source: Author's own work

Table 5.12 shows the highest and the lowest mean scores of the two measuring instruments. The results relating to RFMS indicated that the subscale that received the highest mean score was job characteristics. Retention factors are characteristics that enhances organisational commitment and, as a result, increases employee retention (Döckel, 2003). The high mean score obtained for job characteristics subscale illustrates that the participants enjoyed working with opportunities to solve challenging problems, being flexible, having good leadership and being afforded the chance to engage in interesting assignments and projects. Baghshykhi et al. (2020) confirmed the importance of highly specialised employees enjoying working on challenging projects in which they can use a variety of skills and exercise autonomy.

The low mean score obtained for RFMS was work/life balance which indicates that participants of this research had not placed much importance in striking a balance between their personal lives and work schedules, with the goal of minimizing conflict between the many responsibilities in their personal and professional lives (Van Dyk et al., 2013). According to Rise (2021), employer's health and wellness has a big influence on shaping their overall attitude to work and their lifestyle. However, the outcome of this study revealed that a work/life balance does not positively influence the psychological attachment to the organisation.

The results relating to PCBI indicated that the subscale that received the highest mean score was cognitive coping behaviour. This indicates that when participants experience stressful encounters they rely on their inner cognitive coping efforts for problem-solving, which involves evaluating and thinking through the problem, in order to avoid unpleasant emotions, feelings and memories. Participants used their cognitive attributes (mental resources) to conduct daily activities such as obtaining knowledge, reasoning, remembering, judgment, perceptual processing, and problem solving (Delgado et al., 2020).

Cognitive coping behaviour involves a conscious psychological approach as to how to interpret environmental events that affects an emotional state (Schilbach et al., 2020). Participants viewed negative events, circumstances and challenging situations in a positive way (van der Merwe, et al., 2020). They had a high self-esteem and were able to handle criticism, feedback and stress with ease, as they relied on their inner problem-focused strategies (Hodson & Earle, 2020).

Interpersonal coping behaviour received the lowest mean score, which indicated that participants were not energised by being around other people and did not have to rely on a social network to help them cope in times of need or to cope with stress (Gilmour et al., 2020).

Emotional support, such as work engagement, feedback, teamwork and collaboration, had little influence on their workplace success.

5.6.3 Research aim 1

The results provide partially supportive evidence for research hypothesis H1: T*here is a significant and positive relationship between generational cohorts, positive coping and retention factors.*

5.6.3.1 Interpretation Correlations between Demographical Variables and RFMS

The results of the Spearman rank correlations (Table 5.5) indicated that there was a number of significant relationships found between the demographical variables and RFMS.

- Age revealed significant positive relationships with compensation and all other RFMS variables except for work-life balance, which has a negative relationship this was not statistically significant. Career Opportunities also indicates that no linear association was found between the variables.
- Gender revealed significant positive relationships with training and development and work-life balance except for compensation and career opportunities, which has a negative relationship that is not statistically significant.
- Race revealed significant positive relationship with compensation and other RFMS except for training and development, which has a negative relationship and is not statistically significant.
- Work-life balance also indicates that no linear association is found between the variables.
- Job Level revealed significant positive relationship with all RFMS variables except for career opportunities and work-life balance, which has a negative relationship and is not statistically significant.
- Job Qualification revealed significant positive relationships with all the RFMS variables except for career opportunities, which has negative relationship that is not statistically significant. Training and development also indicate that no linear association is found between the variables.

5.6.3.2 Interpretation Correlations between Generational Cohorts and PCBI

The results of the Hierarchical regression analysis (Table 5.6) indicate that generational cohorts do not significantly influence PCBI.

5.6.3.3 Interpretation Correlations between PCBI and RFMS

There were several significant relationships found between PCBI and RFMS.

- Conative Coping showed significant positive relationships with training and development opportunities as well as career opportunities, while compensation and work-life balance had a negative relationship and is not statistically significant.
- Affective Coping revealed significant positive relationship with all the RFMS variables, except for a work-life balance which had a negative relationship and is not statistically significant.
- Cognitive coping revealed significant positive relationship with all the RFMS variables, except for work/life balance which had a negative relationship and is not statistically significant.
- Social coping revealed significant positive relationship with all the RFMS variables except for and work/life balance, which had a negative relationship that is not statistically significant.

The relationship between demographical variables, PCBI and RFMS variables, Table 5.5 revealed that the associations were all significant and positive. Additionally, there were no significant relationships found between work/life balance and positive coping behaviour.

5.6.4 Research aim 2

The results provided partial supportive evidence for research hypothesis H2: *To identify and explain the relationship between generational cohorts, positive coping and retention factors.* The results of the Kruskal-Wallis test scores for generational cohorts (Table 5.9) indicated that there was no statistically significant difference between generational cohorts (Baby Boomers, Generation X, Generation Y and Generation Z) and PCBI.

The results of the Kruskal-Wallis test scores for the statical significance between generational cohorts and RFMS (Table 5.9) found a statistically significant difference between generational cohorts and career opportunities. Dhanpat et al. (2021) found that career progression and the

prospect of a promotion drastically influences an employee's decision to stay with or leave an organisation. Döckel et al. (2006) share the same sentiment and believe that career opportunities significantly influence job performance and employee retention. Dhanpat et al. (2019) also identified employee loyalty is gained when the organisation promotes career opportunities through learning and development programmes.

5.6.5 Research aim 3

The findings offered some support for the research hypothesis H2: *To conceptualise the effect of demographical variables (gender, race, age, job level and qualification level) on the relationship between generational cohorts, positive coping and retention factors.*

5.6.5.1 Interpretation of test for mean differences

A series of Mann-Whitney U tests and Kruskal-Wallis tests were conducted to determine the existence of differences between the demographical variables (gender, race, age, job level and qualification level) in terms of their relationship between generational cohorts, positive coping and retention factors.

5.6.5.2 Interpretation of test for mean differences: gender

A Mann-Whitney U test was conducted to test for significant mean differences regarding the variables of gender groups, positive coping and retention factors. The results of the Mann-Whitney U test scores for gender (Table 5.7) indicate that there was statistically no significant difference between the different gender groups and positive coping. A significant difference was only found between gender groups and compensation. The high score for compensation indicates that both male and female participants consider compensation as a very important factor. According to Döckel (2003), compensation refers to a remuneration package that consists of monetary and non-monetary incentives. Half (2021) found that compensation is a key factor in employee retention, as compensation has the power to significantly influence on employees' decision to remain loyal or leave the organisation.

5.6.5.3 Interpretation of test for mean differences: race

A Kruskal-Wallis test was conducted to test for significant mean differences regarding the variables of race groups (Black, Coloured. Indian and White), positive coping and retention factors. The results for race (Table 5.8) indicate that there was no statistically significant

difference between the different race groups, positive coping and retention factors. A significant difference was found between race groups and compensation.

5.6.5.4 Interpretation of test for mean differences: generational cohorts

The Kruskal-Wallis test scores for generational cohorts (Table 5.9) indicated that there was no statistically significant difference between generational cohorts (Baby Boomers, Generation X, Generation Y and Generation Z) and positive coping or retention factors. A statistically significant difference was found between generational cohorts and career opportunities. Dhanpat et al. (2019) contend that internal (promoted or transferred with current employer) and external (finds a career opportunity with a new employer) career opportunities influences an employee's decision to stay with or leave the organisation, as most employees strive toward career progression. Research has shown that career growth is important for increasing an employee's commitment and reduces their intentions to leave the organisation (Dhanpat et al. (2021). Döckel et al. (2006) contend that perceived career opportunities drastically influence job performance, organisation commitment and reduces employee turnover.

5.6.5.5 Interpretation of test for mean differences: job level

The Kruskal-Wallis test scores for job level (Table 5.10) indicated that there was no statistically significant difference between the different job levels (Graduate, Candidate Engineer, Candidate Engineering Technologist, Candidate Certificated Engineer, Candidate Engineering Technician, Professional Engineering Technician, Professional Certificated Engineer, Professional Engineering Technologist and Professional Engineer) positive coping and retention factors.

5.6.5.5 Interpretation of test for mean differences: qualification levels

The Kruskal-Wallis test scores for qualification level (Table 5.11) indicate that there was no statistically significant difference between different qualification levels (Grade 12, Diploma or Advanced Certificate, Bachelor's Degree or Advanced Certificate, Postgraduate Diploma or Professional Qualification, Master's Degree and a Doctoral Degree) positive coping and retention factors.

5.7 SUMMARY OF DECISIONS REGARDING THE RESEARCH HYPOTHESES

Table 5.13 indicates an overview of the research hypotheses that were formulated, and conclusions reached, with the first being fully supported and the second and third only partially supported.

Table 5.13

Conclusions regarding the research hypotheses

Research hypothesis	Supportive evidence
H1: There is a significant and positive relationship between generational cohorts, positive coping and retention factors.	Partially Supported
H2: Differences do exist in generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job level and qualification level) from a paradigm perspective.	Partially Supported

5.8 CHAPTER SUMMARY

In order to connect the findings of the literature review with the findings of the empirical research study that was done, this chapter covered preliminary statistical analysis, descriptive statistics, correlation analysis, and inferential statistics pertinent to the study. The study's research goals were therefore addressed in Chapter 5:

This chapter focused preliminary statistical analysis, descriptive statistics, correlation analysis, and inferential statistics. Chapter 5 addressed the following research aims of the study:

Research aim 1: To conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature.

Research aim 2: To identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs.

Research aim 3: To conceptualise the effect of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

CHAPTER 6: CONCLUSTIONS, LIMITATIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter is about the conclusion, limitations and recommendations. It also addresses the specific aim 3, namely, to make recommendations for engineering companies regarding the use of generational cohorts, positive coping and retention factors in the development of employee retention practices and possible future research based on the discoveries of the research. The limitations that may have affected the results are detailed as well as the implications for research.

6.2 CONCLUSIONS

In light of the research's aims, as stated in Chapter 1 (section 1.3.2), this section discusses the results drawn from the literature and empirical investigations.

6.2.1 Conclusions relating to the literature review

This section discusses the results for the three specific aims for the literature. The primary aim of the research was to firstly conceptualise and explain the constructs generational cohorts, positive coping and retention factors within a sample of full-time employed engineers in the engineering sector in South Africa. The secondary aim of the research was to identify and explain the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs. The motivation for this study stemmed from the idea that by establishing a link between generational cohorts, positive coping, and retention factors, the findings may be used to enhance employee retention policies and engineer retention.

In the following section, conclusions were drawn in terms of each of the specific aims regarding the relationship dynamics between generational cohorts (Baby Boomers, Generation X, Generation Y, Generation Z), positive coping (conative coping, affective coping, cognitive coping and interpersonal coping behaviour) and retention factors (compensation, job characteristics, opportunities for training and development, support from supervisors, career

Research aim 1: To conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature.

The first aim, namely, to conceptualise the three constructs of generational cohorts, positive coping and retention factors from a theoretical perspective, was achieved in chapter 2.

Conclusions relating to the three constructs: generational cohorts, positive coping and retention factors from a theoretical perspective.

This section concerns conclusion that can be made regarding the three constructs, generational cohorts, positive coping and retention factors.

Generational cohort theory has been used to understand the attitudes and values of employees' who belong to different generations (Ross, 2021), which can be valuable in explaining and predicting employee behaviour. According to Rudolph et al. (2020) generational cohort theory explains changes and differences that occur across generations. On the contrary to generational cohort theory is that it is assumed that attitudes, inner values, beliefs and worldview are just merely a function of a biological process which is based on an individual's maturity level and age. Generational cohort theory argues that distinctions across generations cannot simply be attributed to a biological process, but are a result of social changes, which impacts on the individual inclinations and cognitive styles (Rudolph et al., 2020).

Positive coping is described as coping behaviour that has an influence on employee engagement in decision-making, as well as the quality of relationships with colleagues and line managers (Shikweni et al., 2019). Singh and Khanna (2011) contend that stress can never be removed from an employee's life, with positive coping skills being necessary to assist in managing stress and preventing harmful emotional and physical effects. Positive coping behaviour allows people to use their emotional intelligence to cope with stressful situations. People's coping reaction affect how they face challenge, and assist people to endure, lessen and deal with problems (Morin, 2020), which affects their ability to perform at their best both psychologically and physically. Positive coping behaviour allows people to discover positive ways in which they must cope with negative and stressful challenges (Marx, 2017).

Positive coping can be measured on a cluster of four positive psychological constructs:

- Conative coping behaviour is an inner mental process that an employee taps into for overcoming the stress they have experienced. Intentional motivation plays a vital role in how people approach challenges, decision-making and problem solving. Positive coping is achieved through self-efficacy, adaptability, and flourishing (Marx, 2017).

- Affective coping behaviour is also referred to as emotion-focused coping behaviour and focuses on improving negative emotional reactions to stress such as uneasiness, fear, sorrow and anger. Positive coping may be particularly useful in certain situations when something situations cannot changed (Ben-Zen, 2017).
- Cognitive coping behaviour involves a conscious psychological approach of how an employee interprets the environmental events around them that affects their emotional state (Schilbach et al., 2020). This refers to an employee's mental activity and the use of traits such as cognitive attributes, self-esteem, and positive reframing.
- Interpersonal coping skills are necessary in professional and individual relationships and range from actively listening and knowing how to respectfully communicate. Harmon (2020), contends that healthy interpersonal skills alleviate stress, improves communication and enhance social relationships. Pentina and Zhang (2016) contend that positive traits such as social support, extroversion and agreeableness.

Retention factors refer to an organisations responsibility to influence an employee's career path to either leave or stay with them (Shikweni et al., 2019). The authors contend that appeals to organisations to invest and retain their valuable skilled employees as skilful employees are drivers of the organisational success. Retention factors are defined as factors that influence an employee's psychological attributes (Döckel, 2003). Döckel (2003) identified six critical retention factors (compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities and a work/life balance) that aids in the retention of valuable employees.

- Competitive compensation has been recognised as a significant technique of attracting, recruiting and retaining top talented employees (Lemma et al., 2020).
- Job characteristics boost employee retention because higher sense of competence and significance in work will lead to stronger loyalty and dedication to the organisation (Baghshykhi et al., 2020; Döckel, 2003).
- Many studies confirm the importance of providing enough training and development opportunities for employees as it is considered as a critical investment strategy for employee growth and development (Döckel 2003).
- Providing supervisor support guides and supports employees, nurtures employee innovation and their sense of achievement, thus increasing their commitment and influencing their intention to say with an organisation (Van Dyk & Coetzee, 2012).
- Various research studies support the importance of the prospect of a career growth, advancement opportunities and challenging work, which influences an employee's decision to stay with or leave an organisation (Dhanpat et al., (2019).

- Research confirms the importance of a balance between personal life and work schedule, with the least amount of conflict possible between their various responsibilities (Döckel, 2003).

Conclusion relating to the retention challenges concerning generational cohorts, positive coping and retention factors

The section below addresses the essential findings pertaining to the retention issues in terms of variables, generational cohorts, positive coping and retention factors.

On a theoretical level, all generational cohorts appreciate career opportunities since it has a significant impact on their job performance and organisational engagement (Döckel et al., 2006). Employee loyalty is gained, according to Dhanpat et al. (2019), when the organisation provides career opportunities through learning and development programs. As most Engineers aim for professional advancement, Dhanpat et al. (2019) feel that career advancement is vital for improving an employee's commitment and decreasing their desire to leave the organisation (Dhanpat et al., 2021).

Given the shortage of Engineers there is a need for ongoing research on the human resources strategies that retain people in organisations, specifically engineers (Ntimba, 2021). Attributes such as an employee's aptitude, their working conditions, and the mental and physical demands all influence the employee's performance, motivation and absenteeism. All employees want to work in a challenging environment whereby they can use their valuables skills and abilities (Döckel et al., 2006). Baghshykhi et al. (2020) confirmed the importance of highly specialised employees relish working on challenging projects in which they can use a variety of skills and exercise autonomy. Vui-Yee (2020) found that job characteristics are considered a major contributing factor in the retention of highly specialised employees.

In summary, no research on generational cohorts, positive coping and retention or retention variables was found for the South African engineering sector. The literature suggests that generational cohorts and positive coping may have an impact on retention variables. The link between generational cohorts, positive coping and retention variables appears to be understudied. The findings may be useful in increasing awareness regarding employee retention practices of talented engineers in South Africa.

Research aim 2: To identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs.

The second aim, namely, to identify and describe the relationship between generational cohorts, positive coping and retention facts from a theoretical perspective, was explained in in chapter 3.

Sub-aim 2.1: To conceptualise the relationship between generational cohorts and positive coping attributes from a theoretical perspective

Generational cohorts are connected to positive coping on a theoretical level. According to Coetzee et al. (2017), dealing with daily stress requires a cluster of positive psychological variables (conative, emotional, cognitive, and interpersonal coping behavior). Li and Tang (2021) believe differences in coping strategies between age cohorts confirms that there is a definite link between age and coping behaviour. Each generation is diverse in the way they think and depending on the challenge at hand, each personal that falls into a different generational cohort will display vastly different feelings and reactions (Willis & Willis, 2020). Recent studies have found the complexity of the problem will dictate which positive coping mechanism a generational cohort will tap into (Min et al., 2021). Tang (2021) concurs that patterns of coping strategies are found to change with age. Agrawal and Jaiswal (2013) concur with this viewpoint that older age cohorts consistently use more affective (emotion-focused) coping strategies, whereas younger age cohorts use their cognitive (problem solving-focused) coping strategies (Zimmer-Gembeck & Skinner, 2016).

Sub-aim 2.2: To conceptualise the relationship between generational cohorts and employee retention from a theoretical perspective.

Vasconcelos (2018) contends that age is very much a key variable that influences employee turnover as older employees are valuable assets because of their resilience to change, they are able to remain focused, they are more loyal and stay committed to the organisation. Whereas Ertas (2015) found that the Millennial generation in any sector has a higher probability of employee turnover than of the other generational cohorts. Lewis and Choi's (2011) research findings indicate that younger age cohorts are more sharing of their intention of leaving an organisation, compared to older generations.

Sub-aim 2.3: To conceptualise the relationship between positive coping and employee retention from a theoretical perspective.

According to research, organisations that anticipate continuous change must guarantee that they recruit and retain employees who can be adaptable and positively cope with change (Min et al., 2021). Delgado et al., (2020) found that when employees experience stressful encounters they rely on their inner cognitive coping efforts for problem solving. According to Min et al. (2021) organisations must understand how their employees cope with stress and then develop positive coping mechanisms to assist with stress management, as this will reduce employee turnover. Daugherty (2021) argued that by understanding a multi-generational workforce, managers can identify positive coping motivators that could be implemented to retain their valuable talent. In addition, Döckel (2003) believes that retention factors influence an employee's psychological attributes, retention factors such as compensation, job characteristics, opportunities for training and development, support from supervisors, career opportunities and a work/life balance aids in the retention of valuable employees. Literature supports the notion that job characteristics has a significant influence on professional autonomy and employee retention (Baghshykhi et al., 2020). Vui-Yee (2020) found that job characteristics are considered a major contributing factor in the retention of highly specialised employees.

My understanding is that now you have presented what the theories reported in the literature, you will present what you found, and then at the end you can redo the figure above and only put in those variables that you found to be important, that would be a nice summary and very visual.

6.2.2 Conclusions relating to the empirical study

On a more practical level, the study aimed to assist in the construction of an empirically tested profile that may benefit employers in better understanding retention issues.

In terms of the empirical study, the specific aims were to meet the following:

Research Question 1: To conduct an empirical investigation into the statistical association between generational cohorts, positive coping and retention factors in a sample of engineers employed in the South African engineering sector and to identify the implications of the employee retention practices.

Research Question 2: To empirically investigate whether differences exist in generational cohorts, positive coping and retention factors in terms of demographical variables (gender,

race, age, job level and qualification level) in the sample of engineers employed in South Africa.

Research question 3: To formulate recommendations for engineering companies regarding the use of generational cohorts, positive coping and retention factors in the development of employee retention practices and possible future research based on the discoveries of the research.

For H1 and H2 the statistical results gave partly supportive evidence. As conclusions, the findings for each of the study objectives, as well as the hypotheses that need additional debate, are offered.

6.2.1.1 Research aim 1: To conduct an empirical investigation into the statistical association between generational cohorts, positive coping and retention factors in a sample of engineers employed in the South African engineering sector and to identify the implications of the employee retention practices.

In Chapter 5, the findings related to the nature of the relationship between generational cohorts, positive coping and retention factors were presented, and confirmed study hypothesis H1: There is a significant and positive relationship between generational cohorts, positive coping and retention factors.

There are few empirical research on the link between generational cohorts, positive coping, and retention factors, especially in the context of engineering in South Africa.

Age showed significant positive relationships with compensation, which indicates that particular cohorts consider this to be a particularly important factor. Half (2021) found that compensation is a key factor in employee retention, as it significantly influenced employees' decision to remain loyal or leave the organisation.

Gender showed significant positive relationships with training and development, which indicates that both male and female participants consider training and development as an important factor. Dhanpat et al. (2019) also identified employee loyalty is gained when the organisation promotes training and development opportunities.

Race showed significant positive relationship with compensation. Döckel et al., (2006) found that compensation was most influential factor in retaining employees.

Regardless of Job level and qualification level Florentine (2021) believes that employees that fill senior management positions have a good organisational fit, they are willing to make personal sacrifices for organisational benefit, they are far more committed than lower-level employees and pose a higher level of retention.

The relationship between PCBI and RFMS revealed that the associations of affective coping, cognitive coping and social coping were all significant and positive. However, Conative coping showed a significant positive relationship with training and development opportunities. When employees tap into their conative coping (inner metal processing) their self-efficacy is more inclined to seek training and development opportunities, as a result of which employees become loyal and remain with the organisation (Van Dyk & Coetzee, 2012).

6.2.1.2 Research Aim 2: To empirically investigate the influence of demographical variables (gender, race, age, job and qualification level) on generational cohorts, positive coping and retention factors.

Assess the influence between generational cohorts, positive coping and retention factors in terms of demographical variables in the sample of engineers employed in South Africa was addressed in chapter 5. The results provided partial supportive evidence for research hypothesis H2: Differences exist among generational cohorts, retention factors and positive coping in terms of demographical variables (gender, race, age, job and qualification levels). As there has been limited empirical research on the relationship between generational cohorts, positive coping, and retention factors (particularly in the multicultural South African engineering context), the findings should be interpreted with caution in terms of their practical implications without further research.

The following conclusions relating to the empirical relationship between generational cohorts and positive coping significantly and positively influence retention factors can be drawn. While individuals' generational cohorts do not appear to influence retention factors, the results indicate that affective positive coping (emotion-focused coping) does influence employee retention. The findings imply that organisations should work to improve employees' negative emotional responses to stress, such as anxiety, fear, sadness and rage. Employee well-being programs and activities should be designed to guarantee that they are emotionally balanced, have excellent mental health, are resilient to stress, able to manage with positive and negative emotional triggers, and can deal with life crises. Employees who are happy are more likely to be successful in a variety of aspects of their lives, including their professions, work

performance, income, relationships, and general health. Happiness is the hallmark of well-being, and happiness fosters a good attitude that leads to success. Radebe (2020) contends that leaders who make their followers feel appreciated, satisfied and involved are more likely to retain their valuable talent.

6.2.1.3 Research Aim 3: To conceptualise the effect of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

The results provided partial supportive evidence for research hypothesis H2: Differences do exist in generational cohorts, retention factors and positive coping in terms of demographical variables from a paradigm perspective. As there was insufficient empirical research on whether differences exist in generational cohorts, retention factors and positive coping in terms of demographical variables, the findings should be careful not to over-interpreted with reference to the practical implications without further research.

(a) Conclusions concerning the test for mean differences: gender

The results indicate that individuals of different gender groups do not appear to be affected by positive coping, and that retention factors do not appear to effect different gender groups. However, individuals of different gender groups consider compensation as a particularly important factor. Half (2021) found that compensation is a key factor in employee retention, as it has the potential to significantly influence employees' decision to remain loyal or leave the organisation.

(b) Conclusions concerning the test for mean differences: race

The results indicate that individuals of different race groups do not appear to be affected by positive coping, and retention factors do not appear to affect different racial groups. However, individuals of different race groups place great important on compensation. Jonck et al. (2017) found that compensation is a particularly important factor in determining what employees will have to sacrifice if they leave the organisations, making it important for organisations to provide competitive compensation.

(c) Conclusions concerning the test for mean differences: age

The results indicate that individuals of different generational cohorts (Baby Boomers, Generation X, Generation Y and Generation Z) experience no differences in positive coping. Similarly, different generational cohorts do not appear to be affected by retention factors. However, individuals of different generation cohorts seem to place great importance on career opportunities. Dhanpat et al. (2021) contend that career opportunities influence an employee's decision to stay with or leave the organisation, as most people strive toward career progression.

(d) Conclusions concerning the test for mean differences: job level

The results indicate that individuals of different job levels (Graduate, Candidate Engineer, Candidate Engineering Technologist, Candidate Certificated Engineer, Candidate Engineering Technician, Professional Engineering Technician, Professional Certificated Engineer, Professional Engineering Technologist and Professional Engineer) experience no differences in positive coping, nor do they appear to be affected by retention factors.

(e) Conclusions concerning the test for mean differences: qualification level

The results indicate that individuals of different qualifications levels (Grade 12, Diploma or Advanced Certificate, Bachelor’s Degree or Advanced Certificate, Postgraduate Diploma or Professional Qualification, Master’s Degree and a Doctoral Degree) experience no differences in positive coping. Similarly, different qualification levels do not appear to be affected by retention factors.

Despite the fact that the findings add to the understanding of generational dynamics, positive coping and retention variables, and differences in gender, race, age, job level, and qualification level, the study's usefulness is limited by the demographic profile of the sample group. This means that the conclusions of this study cannot be applied to a larger range of occupational categories or demographics.

6.3 LIMITATIONS

The literature review and empirical investigation both had a number of limitations, which are highlighted below.

6.3.1 Limitations of the literature review

The exploratory research on generational cohorts, positive coping and retention factors in the South African context was limited due to the following:

- The study only looked at three variables (generational cohorts, positive coping and retention factors), while other variables may also be important that were not consider.
- By utilising Coetzee and Potgieter (2019) PCBI model, the research was limited to conative (motivational), affective (emotional), cognitive and interpersonal (social) coping behaviour.
- By using Döckel (2003) retention factor model, the research was limited to compensation, job characteristics, training and development opportunities, supervisor support, career opportunities and work-life balance.
- There is a scarcity of research on the relationship between generational cohorts, positive coping, and retention factors, both in South Africa and globally.
- No relationship, prediction and significant differences could be found.

6.3.2 Limitations of the empirical study

Due to a number of factors, such as the psychometric features of the generational cohorts, PCBI, and RFMS, the findings of this research may be limited in their ability to generalise and make practical suggestions. The following empirical research limitations should be noted:

- The self-designed demographical questionnaire, PCBI (Coetzee & Potgieter, 2019) and RFMS (Döckel, 2003) was based on the participant's self-awareness and personal perceptions, which might have influenced the results validity.
- The majority of the participants in the research were White males; a larger sample size with more equal distributed demographics may have shown different results.
- A small sample size of 151 participants makes it difficult to generalise the findings, as they only represent 6.04% of the 2 500 registered engineers in the country.
- The use of an on-line survey meant that the study had not control over who participated and could not target specific people to ensure that the different demographic variables were adequately catered for, such as race, age and gender.
- As a quantitative study it did not explore the respondent's opinions about why they made the choices they did, and care therefore needs to be taken when making assumptions about the implications of the findings.

Despite the aforementioned constraints, the research shows promise in terms of investigating the variables that influence retention factors.

6.4 RECOMMENDATIONS

Based on the findings of the research, a number of recommendations are made for engineering companies and the engineers themselves.

6.4.1 Recommendations for organisations

Based on the research findings and relationships that materialised, the following organisational interventions concerning retention strategies (in terms of generational cohorts and positive coping) are recommended:

- The selection and recruitment process should be intuitive about generational characteristics, the communication mix and career adaptability.
- Establish a two-way mentoring program that will provide a fair and equal learning environment for all age cohorts, while also allowing colleagues to develop stronger interpersonal relationships. This would ensure that all employees like their jobs, as they should be able to do a variety of tasks, have job autonomy, manage difficult challenges, be adaptable, work with competent leadership, and be given the opportunity to work on exciting assignments and projects. A two-way mentorship also enables management to see the disparities between multi-generational employees and the impact this has on employee retention.
- Organisations should invest in team-building activities of bridge the generational communication gap, by which employee self-esteem will be improved and all generations will become more integrated into the organisation. Employees with high self-esteem would also be able to manage criticism, feedback and stress with ease, as they will rely on their own cognitive coping abilities.
- Continually engaging with employees, by understanding a multi-generational workforce, managers can identify positive coping motivators that could be implemented to retain their valuable talent.
- Organisations should also invest in understanding how their employees cope with stress and develop positive coping mechanisms to assist with stress management, as this will reduce employee turnover.
- Organisations must provide career opportunities for all generational cohorts, as this influences an employee's decision to stay with or leave the organisation. Research has

shown that career growth is important for increasing an employee's commitment and reducing their intentions to leave the organisation. Career opportunities also drastically influences job performance, organisation commitment and reduces employee turnover.

- In a virtual world, post-COVID, where there are no longer geographic restrictions, organisations should provide fair competitive compensation plans that are balanced with benefits that entrench employee and increase their drive to deliver outstanding results.

6.4.2 Recommendations for Human Resource professionals

The following recommendations are relevant for human resource professionals working in the field of recruitment and employee retention:

- The PCBI and RFMS should be used by human resource managers and practitioners to learn more about what kind of employee would fit well in their company (to match the individual's and the company's needs and values), what keeps employees loyal, and how to increase employee retention by implementing appropriate retention factors strategies and practices.
- Human resource managers and practitioners should utilize the RFMS to establish employee retention strategies and to help workers with their retention-related requirements when adopting practices in order to provide them with the knowledge they need to make educated retention decisions.
- Top management and the human resource department should be encouraged to devote substantial time, effort, and financial resources to improving the firm's ability to retain clever, talented, and valued people, as this will provide the company a competitive advantage in the marketplace.
- Attractive compensation packages with fair and transparent remuneration and incentive systems should be developed and implemented. To satisfy the continually changing demands and circumstances of employees, remuneration packages should be reassessed on a regular basis.
- Employees will be able to recognise their strengths and development areas in terms of the psychological attributes that are required for successfully coping with workplace stress if they receive regular career counselling from Mentors.
- Organisational career management practices should also take into consideration the differences observed in the demographic variables (gender, race, age, job level and

qualification level). Soft, hard and technical skills training workshops should be continually available to all employees.

6.4.3 Recommendations for Individuals

Based on the research findings and relationships that materialised, individual interventions pertinent to career development and career counselling techniques are made:

- It is important that individuals should engage in career counselling as a method of addressing their career progression, self-efficacy and increasing their cognitive and emotional coping behaviour.
- Individuals should strive to participate in the training programmes offered, as this will open the door to a wider scope of career opportunities. This will also give employees the prospect of being promoted or transferred with their current employer, which can influence job performance, organisation commitment and turnover.
- Employees who are not coping with occupational stress should engage with their line managers or mentors and request that they be sent on workshops or training programmes that could empower them to positively cope with everyday stressors.
- Individuals should engage with their organisation on an ongoing basis regarding their remuneration packages as this will avoid unnecessary employee turnover.

Table 6.1 Is a summary of recommendations.

Table 6.1

Summary of Recommendations

Recommendations to:	Positive Coping	Retention Factors
Organisations	• The selection and recruitment drive must be intuitive about generational characteristics, communication mix and career adaptability. • Investment must be made in team-building activities as it will bridge generational communication and improve employee self-esteem. Employees with high self-esteem would also be able to manage criticism, feedback and stress with ease as they will rely on their own cognitive coping abilities. • Managers should continually engage with their multi-generational workforce as; it will help them identify positive coping motivators that could be implemented to retain their valuable talent.	• Establish mentoring program will enable management to spot any disparities between a multigenerational workforce before the impact on employee retention can be felt. • Organisations must provide career opportunities, as most employees strive toward career progression. Research has shown that career growth is important for increasing an employee's commitment and it reduces their intentions to leave the organisation. Career opportunities also drastically influences job performance, organisation commitment and reduces employee turnover. • In a virtual world there are no longer geographic restrictions, therefore organisations should provide fair competitive compensation plans which are balanced with benefits that entrenches the employee and increases the employee's drive to deliver outstanding results.
Human Resource Professionals	• Human resource managers should use the PCBI to learn more about what kind of employee would fit well in their company (in terms of a match between the individual's needs and values and the company's needs and values), what keeps employees loyal to the company, and how to increase employee retention by implementing appropriate retention factor strategies and practices. • Regular career counselling with Mentors will assist employees in recognising their strengths and development areas in terms of the psychological traits that are essential for positively coping with occupational stress.	• In order to equip employees with the information to make informed retention decisions, HR managers and practitioners should use the RFMS in the creation of employee retention strategies and when implementing practices to support employees with their retention-related requirements. • Attractive compensation packages with fair and transparent remuneration and incentive systems should be developed and implemented. Remuneration packages should also be evaluated on a frequent basis in order to meet the constantly changing expectations and conditions of employees.

Individuals	• It is important that individuals engage in career counselling as it is a method of addressing career progression, self-efficacy and increasing cognitive and emotional coping behaviour. • Employees that are not coping with occupational stress should engage with their line managers or mentors and request that they be sent on workshops or training programmes that could empower them to positively cope with everyday stressors.	• Individuals should strive to participate in all any training programmes offered as this will open the door to a wider scope of career opportunities. Career Opportunities also gives employees the prospect of being promoted or transferred with their current employer which drastically influences job performance, organisation commitment and turnover. • Individuals should engage with their organisation on an ongoing basis regarding their remuneration packages as this will avoid unnecessary employee turnover.

Source: Author's own work

6.5 INTEGRATION OF RESEARCH

The purpose of this research was to investigate the relationship between generational cohorts, positive coping, and retention factors, specifically in the engineering sector. The literature review confirmed a relationship between generational cohorts, positive coping and retention factors, although no single integrated study was found linking the three variables of generational cohorts, positive coping and retention factors in the South African consulting engineering sector. In particular, limited research was found with regard to both positive coping and retention factors in the consulting engineering sector.

The empirical results of the research prove that a significant relationship exists between generational cohorts, positive coping and retention factors and provides statistically positive evidence to support the hypotheses.

6.6 RECCOMMENDATIONS FOR FUTURE RESEARCH

In light of the findings, conclusions, and recommendations, the following suggestions for further research are made:

In order to improve external validity, future research might focus on getting a larger and more representative sample. In this study, the sample size was a limitation. The sample may be improved by looking at a wider range of demographic traits, keeping a balanced representation of different generational cohorts, and include positive coping and retention factors.

More study is needed in the South African context on the link between generational cohorts, positive coping, and retention variables. If consistent findings can be established over time, it may be possible for consulting engineering firms and human resource professionals to develop a practical and trustworthy framework to help retain valuable engineers.

Further research is required including the different cohorts to explore the reasons for their staying with or leaving a company, as that may refine some of the variables or broaden the scope.

6.7 CHAPTER SUMMARY

This chapter presented the conclusions of the research in terms of the theoretical and empirical aims of the research. Possible limitations were clarified in terms of both the

theoretical and empirical investigations. In addition, recommendations were made for future research to investigate the relationship between generational cohorts, positive coping and retention factors. In summary, the research provided support of the relationship between the variables generational cohorts, positive coping and retention factors.

With this, chapter 6 accomplished the following research aims:

Research aim 1: To conceptualise and describe the constructs generational cohorts, positive coping and retention factors in terms of theoretical models in the literature.

Research aim 2: To identify and describe the relationship between generational cohorts, positive coping and retention factors in terms of theoretical models of these constructs.

Research aim 3: To conceptualise the effect of demographical variables (gender, race, age, job level and qualification level) on generational cohorts, positive coping and retention factors.

In conclusion, this research, in particular, lays the groundwork for future research and makes suggestions for supporting businesses and human resource professionals in attracting, developing, and retaining excellent engineering talent.

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