LIFE STORIES OF MANAGERIAL AND PROFESSIONAL WOMEN IN THE SOUTH AFRICAN MINING INDUSTRY

by

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DECLARATION

I, Lesego Letlape, declare that *Life Stories of Managerial and Professional Women in the South African Mining Industry* is my own unaided work both in content and execution. All the resources I used in this study are cited and referred to in the reference list by means of a comprehensive referencing system. Apart from the normal guidance from my study leader, I have received no assistance, except as stated in the acknowledgements.

I declare that the content of this thesis has never been used before for any qualification at any tertiary institution.

I, Lesego Letlape, declare that the language in this thesis was edited by Cynthia Ayeza Mutabaazi.

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Signature: Lesego Letlape   Date

ABSTRACT

LIFE STORIES OF MANAGERIAL AND PROFESSIONAL WOMEN IN THE SOUTH AFRICAN MINING INDUSTRY

By

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SUPERVISOR	: Prof S M Nkomo
DEPARTMENT	: Human Resource Management
DEGREE	: Mcom – Industrial Psychology

This study explores the life stories of eight women in the South African mining industry; four older women in senior managerial positions and four younger women who have recently acquired a technical mining-related qualification that should place them on the path to management. A major goal was to understand how the women came to their careers in mining, the field being a non-traditional choice for women. The study also aimed to explore how working in a male-dominated industry affected their current life experiences and future aspirations. Life story interviews were conducted to trace the journeys they took to their present positions. The stories collected were then analysed using qualitative thematic analysis through *Atlas.ti,* to derive patterns in the accounts collected, as well as any differences that may exist between the two groups of women.

The results indicate that each woman's life story is unique. However, significant patterns were found during the analysis. Both the younger and older women were raised in nuclear family structures, consisting of two parents and one or more siblings. Both groups of women also displayed a high affinity towards academics and performed well throughout their basic education years, while displaying a specific interest in the scientific- and technically-related fields. This was then followed by attendance of a higher education institution, with continued high performance. At this point most of the women entered the mining industry, through a bursary from a mining company requiring them to work back the bursary as an employee of the company. The participants all have a high level of ambition

and desire to succeed in their respective professions. The results provided insight on how early life and other influences shaped the women's career choices.

Although the participants were diverse in their method of entry into the mining industry and the motivations or factors that have thus far kept them there, their workplace experiences have been similar, even though their reactions to them varied. They faced challenges related to being respected professionals despite their gender, career delays, sacrificing femininity to conform to a masculine environment, and exposure to overt sexual harassment. These challenges and experiences have been a source of growth for some, mainly in the older cohort, and a signal to exit the industry for others, mainly in the younger cohort. This explains to an extent why the technically qualified women-miner statistics have remained stagnant, since half the women are leaving the industry as fast as they are entering. Overall, the results of the research paint a bleak picture of the leadership and professional pipeline for women in mining. The implications of these findings for research and organisations in South Africa are discussed.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIFE STORIES OF MANAGERIAL AND PROFESSIONAL WOMEN IN THE SOUTH AFRICAN MINING INDUSTRY

CHAPTER 1: INTRODUCTION TO THE STUDY

Figure 1: Women in mining

The Figure above depicts what is fast becoming the new face of the mining industry, that of women in post-1994 South Africa (Denton & Vloeberghs, 2003). This is a bold statement, and one that has been made with forethought, especially considering the perilous journey women have faced in getting recognition within the mining industry. The Minister of Mineral Resources, Honourable Phindile Shabangu, is a prime example of the direction the mining industry is headed. She is a black woman leading a highly masculine industry. The question is not whether or not women are entering the industry, but rather how did they get in and their future aspirations.

The word "woman" is seen as a synonym for the word "female", but what exactly is the difference? The title of the study is the "Life Stories of *women* in the South African Mining Industry", not the life stories of *females* in the same industry. This is to make salient to the reader that this is a research topic greatly influenced by societal expectations attached to gender roles, in particular those of being a woman; and to depict the stories of the few who choose to go against the status quo. What are the stories of these women? Should the stories be noted at all? What were or are the obstacles, the rewards, the heartache and the laughter? This study investigates the life stories of eight women who chose to build their careers in the mining industry and to explore the journey travelled from childhood to manager and professional.

Mining is a male-dominated industry; this is a widely known fact. It is hard labour, in uncomfortable working conditions where temperatures can reach as high as 53°C. After a hard day of labour, employees have to return to dilapidated living quarters in a rural area with very few public facilities. These hard working conditions have led most to say that mining is no place for women which has resulted in a lack of women entering the industry at the grassroots, leading to them widely lacking in managerial, professional and technical positions (Ragins, Townsend, & Mattis, 1996). The tide is turning, however, since women are steadily entering the mining industry and are demonstrating good career progression and growth. This has been mainly driven by legislation such as the Employment Equity Act, the Mining Charter and the South African Constitution which mandate the refute of unfair discrimination and promotion of human rights and the work of social societies such as Women In Mining (WIN) forum.

Research conducted in the past on women in mining has mainly focused on women working underground and in technical jobs such as artisans, but little research has been done on women above ground; particularly, those in managerial positions or others who aspire to such positions by virtue of their formal qualifications. This latter group is a relatively new phenomenon in South Africa. Little research could be found that focused on women in the South African mining industry holding top managerial positions or in the technical disciplines (skilled jobs). There remains a need to uncover the challenges they face in these positions within the industry as well as their life and career journeys.

1.1 BACKGROUND AND CONTEXT

"The systematic marginalisation of the majority of South Africans, facilitated by the exclusionary policies of the apartheid regime, prevented Historically Disadvantaged South Africans (HDSAs) from owning the means of production and from meaningful participation in the mainstream economy. To redress these historic inequalities, and thus give effect to section 9 (equality clause) of the Constitution of the Republic of South Africa Act 108 of 1996 (Constitution), the democratic government has enacted, inter alia, the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA)."

South African Mining Charter

It is this very systematic marginalisation that is stated in the opening statement of the mining charter that has led to a small quantity of women joining the mining industry in the past. Anglo Gold stated in their 2008 annual report that women in South Africa make up only 4.14% of those going underground as labourers and engineers in their company. The Chamber of mines in 2011 stated that women make up 11.3% of the total number of people employed by the mining industry; mainly in administrative and Human Resource (HR) positions (Mayes & Pini, 2010).

Despite these bleak numbers, the number of women entering the mining environment is growing, mainly due to legislative pressure. The state is mandating mining companies incorporate more women into their activities at all levels. Secondly, the business world is painfully aware of the current skills shortage, more so in South Africa. Dubbed, "the war for talent" by McKinsey & Company (2001), the scarcity of skills makes it necessary for the business world to incorporate the skills of women in their mining activities to not only excel in business, but also survive.

Lastly, companies are incorporating more women into their operations as part of their corporate social responsibility; put simply, it is the right thing to do. Table 2 below shows the statistics presented by the Department of Mineral Resources (DMR) audit through the chamber of mines in 2011, and is the latest data publicly qualified as correct available on the overall number of women participating in mining.

Table 1: Number of women versus men in the mining industry

Number of Employees			
Sub-industries	**Period**	**Male**	**Female**
Gold	2011	114 900	11 192
P.G.M (Platinum)	2011	118 401	12 221
Iron Ore	2011	7 039	1 364
Manganese	2011	2 761	350
Chrome	2011	7 838	1 356
Diamonds	2011	7 963	1 161
Coal	2011	34 786	5 141
Brick making materials	2011	198	13
Special clays	2011	201	63
Dimension Stone	2011	1 384	110
Limestone	2011	2 005	193

Other minerals	2011	11 570	1 628
Salt	2011	525	143
Aggregate and Sand	2011	5 280	714
Total	**2011**	**314 851**	**35 649**

Source: Chamber of mines (2011)

The Chamber of Mines document lists the total number of women within each sub-industry of mining. It does not differentiate between supportive or core functions and does not detail what percentage of these women are in supervisory and managerial positions. The number of women found in the mining industry as a percentage of the total number of employees is 11.3%. Although this is aligned to the DMR's target of 10% by 2009, when compared to the demographics of the economically active population, where women make up 45%, the economic participation of women in the mining industry is extremely low.

Various mining companies have reported improved progress from the last statistics released by the DMR on their company websites. These Figures report the 2013 percentage of women working in the mining industry as closer to 14%. The succeeding Figure portrays the aforementioned statistics which have not yet been verified by the DMR.
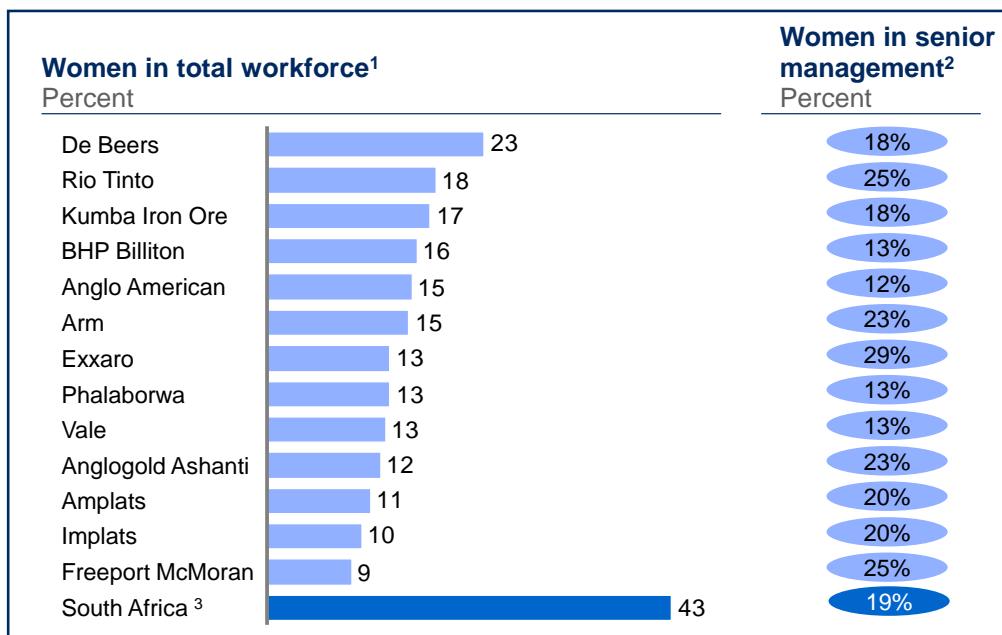
Figure 2: Women representation in mining companies (Company websites, 2013)

1 Kumba and Anglo American data excludes contractors, other companies may include contractors; Anglo American numbers include all divisions. 2 Group management committee and/or *EXCO/senior management level excluding board*, averages used where no level breakdown was available. 3 % of *economically active women in 2011*, all sectors including community and social services (12.4%) and private households (6.6%)

Figure 2 displays the total number of women in the mining workforce reported by mining companies and the percentage of those women reportedly playing a senior managerial or EXCO role. There seems to be a slight improvement in the numbers of women working in the mining industry, although this is likely to be in non-core areas, such as HR and administration.

The growing number of women in the mining industry can be partly attributed to the advent of democracy in South Africa which has led to a reduction in the level at which discrimination is openly displayed by members of the general population. The outlawing of unfair procedural and policy discrimination in any form has also alleviated the discrimination women experience in the workplace (Employment Equity Act, No. 55 Of 1998, 1998). Furthermore, the formation of bodies such as the South African Women in Mining Association (SAWIMA) in 1999 has made a significant move towards advancing the rights of women in the mining industry. The movement has aided the advancement of women entrepreneurs and women in managerial functions in the mining industry.

Due to legislative pressure from the state, mining companies started employing women as tokens, to display to the wider media that they were making a move towards an integrated society (Murray & Peetz, 1994). Since 1994 when Murray and Peetz published their findings, women have moved away from the token label and are actively asserting themselves in business. Women miners have progressed to driving trucks, being artisans and working underground; to much contempt from their male counterparts (Anglo Gold, 2008). Considering the difficulty reportedly faced by women in performing menial functions -such as those in low skilled technical jobs- in the mining industry. What challenges do women face when performing managerial, supervisory, or skilled functions?

Bearing in mind the masculine nature of the mining industry in South Africa, one question comes to mind; do the women in lower and higher levels of management in the industry have to sacrifice their femininity to be taken seriously by their male counterparts? In an environment where a sexist comment and sexual harassment may be an accepted norm, is displaying femininity considered a display of weakness? Many women in the mining industry, particularly the technical and scientific positions claim that this is reality for them, as idealised notions of equality often fail to change the tide of reality (Macintyre, 2010).

In these situations, women often find themselves confronted with the "glass ceiling"; a phenomenon that occurs in the corporate world to women, where they can see the possible positions at the top, but in reality only reach up to a certain level within the organisation (Barreto, Rayn & Schmidt, 2009; Bell & Nkomo, 2001). This explains the phenomenon found in many mining organisations, where women only reach senior management (Ragins *et al.*, 1996), and only a few are found in top management. This was also noted by Retha Piater, the Executive General Manager of Human Resource at Exxaro Resources (Piater, Personal Interview, 2012) in a verbal statement on women in mining.

The study investigated the life stories of two groups of women working in the mining industry. One group comprised of women who have made it into the senior ranks of mining and the other group consisted of young professional women who have recently entered the mining industry. The focus was on their life journeys and career choices and the experience of being a woman in mining. This also provides an idea of the women leadership 'pipeline' available in the South African mining companies.

1.2   PROBLEM STATEMENT

Women in non-traditional industries such as mining, face difficulties when attempting to advance their managerial careers; yet some women have managed to break through the barriers, while other women choose to follow them. The study aims to analyse the women's stories to understand the journeys of those women managers in mining who have been able to crack the glass ceiling, as well as the younger generation of women who have chosen mining as a career. The former group is of interest because they represent a group of women who have managed to break through the glass ceiling into senior or executive positions. The latter group of women is also of interest since they would have acquired the requisite educational qualifications for entry into the industry (i.e. mining engineering and technically related disciplines) that should place them on a path to managerial and leadership positions.

For those who have made it into leadership positions in senior management or the new generation that has chosen a career in mining, stories exist on how they were able to overcome the formidable barriers encountered by women in a male-dominated industry.

Understanding their stories should assist mining companies to understand women in mining and particularly those who hold managerial and professional positions in the industry. Furthermore, the mining industry is under considerable pressure to increase the number of women in mining at all levels, particularly at the managerial and leadership levels. To assist, more knowledge is needed about the current profile of women in these positions and the leadership pipeline.

1.3   RESEARCH PURPOSE

The purpose of the study was to explore the life stories of two groups of women in the mining industry, and to understand the leadership pipeline of women within the industry. The first group consists of four women who occupy top and/or senior managerial positions in companies within the mining industry. The second group consists of four younger women who hold technical mining related degrees and who have just begun their careers. The latter group is of interest because they acquired the requisite educational qualifications to build a career in the industry (i.e. mining engineering and technically related disciplines).

1.4   RESEARCH OBJECTIVES

The study had the following research aims:

- To understand the life stories of two groups of women within the mining industry in South Africa;
- To illuminate how early life experiences contributed to their current career path;
- To understand why women choose careers in mining;
- To identify the obstacles they faced in acquiring their current positions;
- To identify strategies utilised by the women to overcome the obstacles encountered, as well as their future aspirations; and
- To understand the leadership pipeline of women in mining companies.

1.5   SIGNIFICANCE AND CONTRIBUTION OF THE STUDY

Studies in the past have tackled the issue on the status difference between the genders in technical positions (Ragins, Townsend & Mattis, 1996); attempted to explain the underrepresentation of women in the mining industry (Cortis, Chan, & Hilferty, 2009); and examined how family responsibility for women affects the types of careers they choose. Another line of research, has examined equal opportunities for women (Guthrie, Roth, & Guthrie, 1999); while Rhodes (2002) studied the impact of the mining industry on women. For the most part, however, the samples of these studies have comprised of women workers in underground mining. Research focused on women in managerial levels and those with technical mining related qualifications is scant. Further, there has been little research to holistically understand their life stories detailing the trials and tribulations they have faced in their career journeys. This study makes a contribution to filling the gap in research that examines senior women in mining, and adds to the body of knowledge for the managerial and leadership pipeline in these contexts.

Given the increased expectation imposed by employment equity imperatives and the Mining Charter to increase the number of women in mining, the pressure for companies to employ more women will accelerate rather than decline. Understanding the journey of the few who break the glass ceiling, as well as those who have recently started a career in the mining industry will contribute to filling a gap in research and in practise. Mining companies will also gain insight into the psyche of women in the industry as well as that of young professional entrants. The results of this study will assist mining companies to better design programs for effective attraction and retention of women in mining, and to build a managerial and leadership pipeline.

Practically, the study will also assist young women who are entering the mining industry with high career aspirations, to realistically carve a career plan with the relevant potential challenges in mind. This study is relevant in both filling the research gap and in allowing mining companies and their women employees to better connect and collaborate.

1.6   DELIMITATIONS

The delimitations of this study specify the areas that the research has focused on and the areas that the research has excluded, although they may be closely related to the topic being studied. The delimitations fall under the context of the study; the constructs explored; the theoretical perspective; and sampling. The context of the study is the South African mining industry, with no specified concentration of geographical area or sub-industry. Sampling largely relied on where participants could be found within South Africa.

The study was not company specific as it draws its sample from a range of mining and related companies, such as mining researchers within South Africa, as and where participants were found. The study deliberately excluded women managers or leaders that were in support functions. This includes; the Human Resources, Administration and/or Finance departments. The rationale for this exclusion is that if one is to find a woman within a mining company in South Africa, one is likely to find her in one of the abovementioned departments. This is because they are considered more appropriate for women than perhaps working underground, in engineering or any other technical mining related field, such as mine surveying. This is consistent with the literature on women in management that indicates women are often channelled into staff rather than line positions (Guthrie, Roth, & Guthrie, 1999; Cataylst, 2012).

1.7   DEFINITION OF KEY TERMS

Employment Equity Act no 55 of 1998: This act aims to redress the inequalities of the past apartheid regime by mandating that employers eradicate unfair discrimination of any kind. An additional requirement is placed on designated employers –as defined by the Act- to implement affirmative action.

Engineering: A technical field concerned with the design and development of processes, structures and products that meet a need and solve immediate and future problems.

Gender: *Woman* versus *female*: Gender as used in this document is distinguished from sex which refers to biological differences between male and female, and refers to the socially and culturally determined roles of men and women. It is important to note that these roles are not fixed but evolve in response to historical and cultural changes in a society. Gender as a category intersects with other categories of identity such as race, ethnicity, class and sexuality (Calás & Smircich, 2009).

Glass ceiling: The glass ceiling is a theoretical construct used to describe a plateau that is experienced by many women in the corporate world where they feel that they can only reach a certain level in the organisation. The use of the word 'glass' is indicative of the claim that in theory, women are free to make it to the highest level of the organisation, but in practice only make it to senior management and not top management. The glass ceiling is used to explain why many top ranks in the corporate world are occupied by men (Eagly & Sczesny, 2009;Tibus, 2010).

Labour Relations Act no 66 of 1995 as amended: This act aims to regulate the relationship between the employer and his or her employees. This includes the management of industrial action and working conditions.

Leadership pipeline: Similar to succession planning, this process involves identifying high potential individuals and then developing them to take up high managerial positions in the future. This process also allows management to identify who are the individuals currently coming through the ranks and therefore can better mould their strategies to meet the capabilities of their future managerial team (Conger & Fulmer, 2003).

Leadership: Defining leadership has become a conundrum that many researchers have attempted to solve. From the ancient Greeks to the digital age, researchers are still trying to define leadership (Bolden, 2004). The definition of leadership has evolved over time. In the early 1920s the prevailing leadership theory was trait theory. Trait theory believed that leadership was characterised by certain personality and physical traits possessed by an individual. As such leadership was defined in terms of traits such as intelligence, confidence, and attractive physical attributes. As research progressed, the trait theory began to come into disrepute and other theories began to emerge, namely the behavioural

and style theories, transformational leadership, charismatic leadership and as of late, authentic leadership (Bolden, 2005). Loosely defined, leadership is the process by which an individual or a group of individuals lead a person or a group of persons towards a specified group goal, through interaction with followers (Lord & Hall, 2005). This study refers to both leadership and management since in most cases, individuals in management positions can also be expected to be leaders.

Life story methodology: The means of using narrative psychology and life stories to answer a research question. This mainly involves using an open-ended, in-depth interview known as the life story interview (Atkinson, 1998).

Life story: When people reach adolescence and young adulthood, they begin to reconstruct their pasts, perceive the present and anticipate the future through an internal and dynamic self-story that provides that individual with some purpose in life (McAdams, 2001, 2006, 2008). This internalised story becomes an individual's life story and the basis by which we form our identity; referred to in this context as an internalised life story (McAdams, 2001, 2006, 2008; Shamir & Eilam, 2005). In essence, the integration of one's past, present and future into a self-narration of "who am I" and "why am I alive" (McAdams, 2006).

Management: The task of planning, organising and executing business plans in order to drive the collective group towards a goal (Jogulu & Wood, 2006).

Mining community: Refers to communities where mining takes place and in labour sending areas (South African Mining Charter, 2010).

Mining Industry: The group of companies that make their revenue through means of mining activities. These companies typically extract minerals and commodities such as gold, coal, platinum and iron ore from the earth. The South African mining industry is composed as follows according to Stats SA (2009):
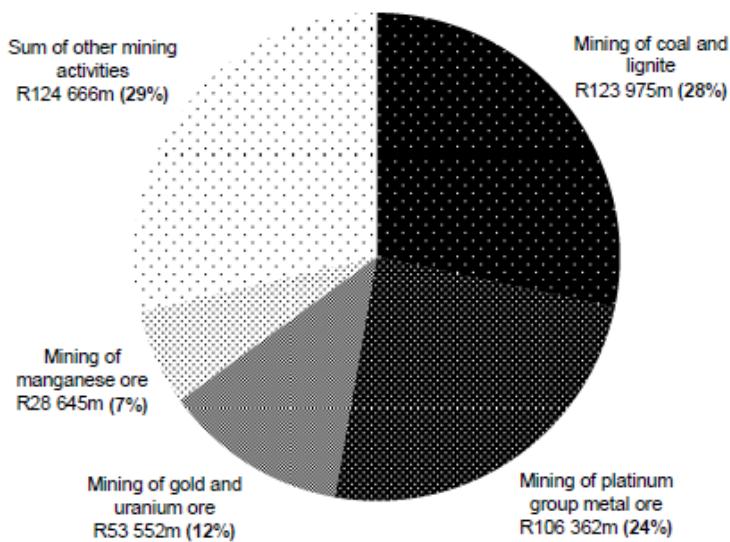
Figure 3: Division of the mining industry and income

Mining legislation: A collective term for all the Acts that govern mining and labour in South Africa. This includes: Mineral and Petroleum Resources Development Act 28 of 2002; and Occupational Health and Safety Act, among those mentioned below.

Mining: The extraction of valuable minerals from the earth (AngloGold Ashanti Report, 2009).

Patriarchy: Dawson (1942), an author on patriarchy, defined it as: "a general organising structure apparent in most social, cultural, and economic practises worldwide, a structure that is considered to promote and perpetuate in all facets of human existence, the empowerment of men and the disempowerment of women" (Young, 2008, p.14). The oxford dictionary defines patriarchy as: "a system of society or government in which the father or eldest male is the head of the family and descent is reckoned through the male line" (Oxford, 2011). A general conclusion can be drawn from the two definitions that patriarchy is a societal system designed to exclude women from wider society and restrict them to the home where they are fundamentally responsible for serving men and bearing children.

Skills development Act no 97 of 1998: This act mandates that employers of a certain size are responsible for up-skilling their employees as a means to redress the skills shortage, and correct the inequalities of the past apartheid regime.

South Africa Constitution Act 108 of 1996: This act aims to set forth the bill of rights that all South Africans are entitled to, and prohibits unfair discrimination of any kind.

Table 2:   Abbreviations used in this document

Abbreviation	Meaning
WIM	Women In Mining
EEA	Employment Equity Act
HR	Human Resources
MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
BWA	Business Women's Association
DMR	Department of Mineral Resources

1.8   LAYOUT OF STUDY

CHAPTER 1: BACKGROUND AND CONTEXT

Chapter one provides a general introduction to the study and information necessary to understand the context of the study. This includes various statistics on the current status of women in mining and the background on how this came about. This chapter further elaborates on the research problem, research purpose, delimitations and ends with a definition of the key terms.

CHAPTER 2: LITERATURE REVIEW

The different avenues of the literature examined include the topic of women in non-traditional careers, women in mining, and then women in leadership in the mining industry. Insights here indicate that women are channelled into gender appropriate careers through gender socialisation and segregation. This occurs in everyday life where young girls are educated in gender stereotypes that lead to stereotypical career choices. Women who choose to go against the norm and choose masculinised careers often face difficulty,

particularly when entering into managerial positions, giving rise to the infamous glass ceiling.

CHAPTER 3: RESEARCH METHODOLOGY

The literature review is succeeded by the methodology section which details the process used by the researcher in conducting the study. The research paradigm and inquiry are given in this section. This is then followed by the process used for sampling, data collection and data analysis including the justification behind each choice. The qualitative research approach enlisted to explore the study was the life story methodology. Purposive sampling was used to find the eight women participants who accounted their life stories through in depth interviews, documented with audio recording.

CHAPTER 4: FINDINGS

Chapter four delves into the analysis of the interviews collected. A professional service was used to transcribe the interviews and then thematic analysis was conducted using *Atlas.ti*. The results of this analysis are laid out under the different 'families' used during the analysis.

CHAPTER 5: DISCUSSION OF THE RESULTS

Chapter five discusses the results obtained from the interviews under the different themes which emerged during the analysis, and connects them to the literature review presented in chapter two. The theory-practise connection is made in this section as a means of understanding the emergent themes.

CHAPTER 6: CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

The culmination of the various sections is then collated to identity patterns in the life stories accounted as the conclusion to the study. Based on the conclusion, specific recommendations are made to future researchers wishing to pursue research on the same or related topic.

1.9 SUMMARY

The dismal numbers presented in this chapter indicate the great need for an intervention in promoting mining as a career choice for women, recruiting women for mining and retaining them once they have entered the industry. This is necessary as mining companies are increasingly facing pressure from the government and greater society to increase the number of women in their operations and not just the office. In order for this to be possible and attainable, more needs to be uncovered about those that are already in the industry through accounting for their life stories. The life stories of managerial and professional women in the mining industry will help fill the gap in research conducted in this field and also assist mining companies to look into the psyche of women miners and managers.

The overview provided by this chapter, along with introducing the purpose, significance and objective of the study will be sublimated by the succeeding literature review in chapter two. The relevant literature will be presented and collated to create a holistic picture of the research conducted covering this subject. These two chapters will serve as the background to the subsequent chapter three that delves into the practical methodologies used to collect, analyse and interpret the data collected.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Societal norms have dictated ever since the beginning of time how different genders ought to behave. This has led to widely accepted roles that women and men play in society. Whereas men are considered to be strong and independent, women are seen as weak and dependent on their male counterparts for survival. These gender role ascriptions have also affected the types of careers viewed as appropriate for women versus men. Women are not perceived to have the competencies to be leaders and managers or to perform well in 'masculine' type jobs. An array of stereotypical beliefs about women's ability to be leaders or to do 'masculine' work affects how people perceive their performance. Nowhere are stereotypical beliefs more identifiable and prominent than in mining, a traditionally male-dominated industry.

Women in mining are a relatively new phenomenon globally. The mining industry is not a generally appealing industry to enter for career building, more so for women. Mining is hard labour and needs individuals who are physically strong for the successful execution of their duties. This premise has led to the exclusion of women from the mining industry, thereby cultivating a negative attitude toward women in the industry, especially towards women managers (Murray & Peetz, 1994). This can be attributed to the stereotypical belief that firstly; women are unsuitable to hold leadership positions as they are over emotional (Gouws & Kotze, 2007), secondly, women do not belong in mining as it is hard labour, and lastly women are too physically weak to perform the necessary tasks. Thus a woman leader or manager in the mining industry may be considered a violation of societal norms to many.

According to the 2011 results by the DMR, women in the mining industry in South Africa constitute approximately 11.3% of the entire mining workforce, with a large proportion of that found in Administrative and Human Resource positions. This is not to say that no women are found performing manual tasks such as working underground, driving trucks, being engineers and artisans. Women do perform these jobs, but they do so in a mainly masculine environment and face opposition from all directions.

This chapter reviews the available literature relevant to understanding women in leadership and women in managerial or professional positions in the South African mining industry. Specifically, it includes the literature available on women in leadership and management, women in mining, factors affecting career choices for women, and women in non-traditional careers or occupations.

The literature is divided into different sections. Firstly the history of women in leadership and management is explored, followed by an examination of women's entry into the mining industry, with a specific focus on technical and manual occupations. The third section focuses on influences when making vocational decisions, followed by investigating women in non-traditional positions, other than mining. This is done with the aim of understanding why women choose to enter male-dominated or masculinised industries that mainly result in a difficult career journey. Lastly, the body of literature culminates into a theoretical foundation for exploring women holding executive positions and those aspiring to such positions in the mining industry. Figure 4 below graphically illustrates the structure of the literature review by detailing the major headings of the chapter.
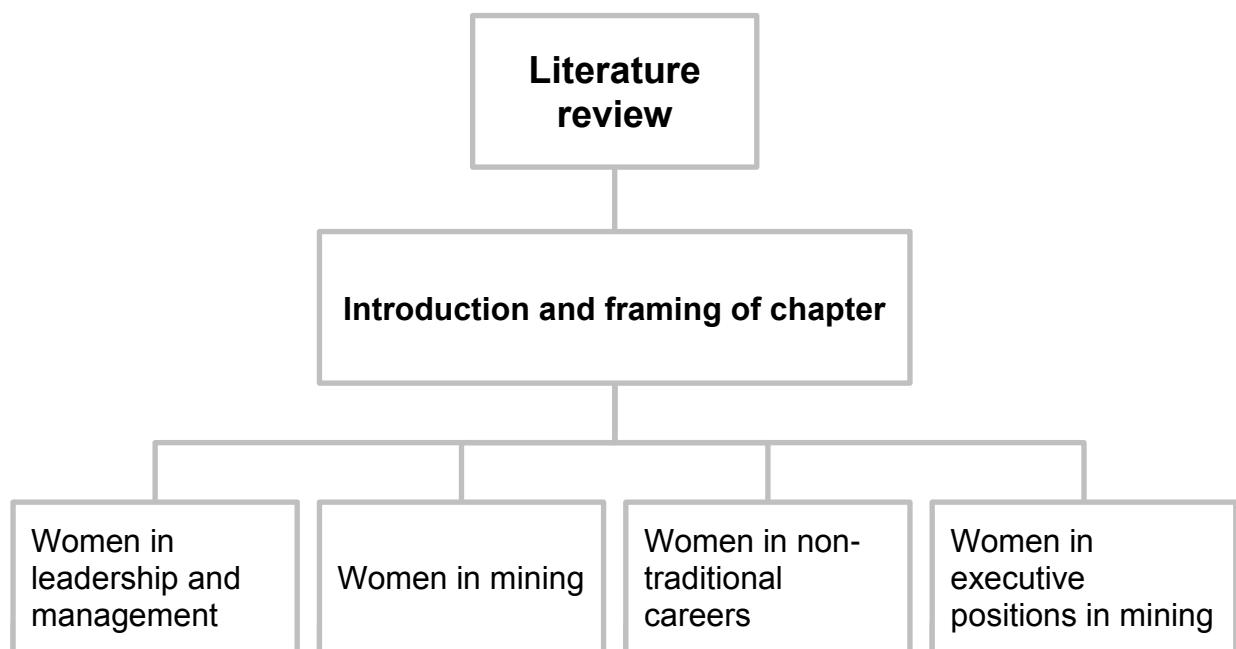
Figure 4: Graphical representation of literature review structure

2.2   WOMEN IN LEADERSHIP AND MANAGEMENT

2.2.1   PATRIARCHY: WHERE IT ALL BEGAN

The societal construct "woman" has a culmination that puts into perspective the expectations dawned upon women since the beginning of recorded history, in essence; the notion of patriarchy and matriarchy. Dawson (1942), an author in sociology, defined patriarchy as: "a general organising structure apparent in most social, cultural, and economic practises worldwide, a structure that is considered to promote and perpetuate in all facets of human existence, the empowerment of men and the disempowerment of women" (Young, 2008, p. 146). The oxford dictionary defines patriarchy as: "a system of society or government in which the father or eldest male is head of the family and descent is reckoned through the male line" (Oxford, 2011). A general conclusion can be drawn from the above definitions that patriarchy is a societal system designed to exclude women from wider society and restrict them to the home where they are fundamentally responsible for serving their men and bearing children.

Most worldly societies have their foundation in patriarchal ideologies; even though they may be considered old fashioned and bigoted in today's society, they have not been completely eliminated. This explains why in matrimony the woman is still expected to forsake her own surname, in essence her heritage, and bear that of the man. Women are slowly moving away from this tradition, with some opting for a double barrel. It is, however, still a social norm to bear the name of your husband. Women are traditionally socialised to be the home maker, and not the leader. Most cultures around the world take a patriarchal standpoint, where the man is normally characterised as the head and hence the leader. This statement holds especially true for African societies, such as the one dominant in South Africa. The advocating of women's rights over the past 60 years, noting in particular the women's march on the 9th of August 1956 and the new South African Constitution of 1996 have been significant in promoting women's rights in South Africa. This trend can also be seen globally.

2.2.2   THE GENDER-LEADERSHIP THEORY CONNECTION

Leadership itself has not been a gender neutral concept. Since its inception as a concept, leadership has been imbued with patriarchal assumptions about the fitness of women to lead and it has largely been a male preserve. Early scholars defined leadership as a constellation of certain traits, thereby implying that one is born with the ability to lead; these are known as trait theorists (Bolden, 2005). If one ascribes to this school of thought, one could then conclude that women may or may not be born leaders based on 'universal' feminine traits. More recently trait theorists have asserted that leadership characteristics can be described in a set of five traits, namely; emotional intelligence, energy, interpersonal communication, relationship skills, and extroversion. Some believe that these recent traits are more reflective of the qualities women possess. This is in contrast to the traditional view that a good leader has 'universal' masculine attributes, such as independence, strength and intelligence (Eagly, 2007). Some trait studies have gone as far as suggesting that only women can act effectively in managerial positions (Andersen & Hansson, 2011).

The behaviourist school of thought views leadership as a behaviour that one can learn and practise. Therefore, women like men, can learn how to be good leaders by identifying the important competencies for good leadership, adopting them and then practising them over time. Leadership-styles, another school of leadership thought, purports that good leaders vary their styles according to the situation they are in, or the type of people being led (Northhouse, 2010). Therefore, the success of a leader in performing their tasks is not dependent on gender, but rather on their style choice based on the situation.

2.2.3   STATUS OF WOMEN IN LEADERSHIP AND MANAGERIAL POSITIONS IN SOUTH AFRICA

Although women have made a significant leap in gaining representation in corporate managerial positions, there is still a general male domination, especially in the most senior and top positions (Eagly & Carli, 2003). Research noted that women were found to make up only 4% of corporate presidents and 10% of the highest decision making bodies in organisations (Eagly & Sczesny, 2009).

Eagly (2007) found that men and women are equally effective in leadership roles, yet despite literature supporting this view, gender stereotypes continue to prevail. The glass ceiling which has been seen as a myth by many in the corporate setting, has been shown to exist and operate within companies globally (Mathur-helm, 2006). This affects the types of positions women attain and how they are judged once they reach those positions. Stereotypes of women's effectiveness in leadership positions, and the general underrepresentation of women in top managerial positions has led to the hypothesis; think manager, think man, which was proven in a study conducted by Booysen and Nkomo (2010). Furthermore, when women do break the glass ceiling, they tend to be judged more harshly and face challenges that are not usually experienced by their male counterparts such as structural barriers, lack of resources and lack of empowerment to make and implement decisions (Al-ahmadi, 2011).

> *"More interventions are required to remove the glass ceiling in order to increase the representation of women at particularly the Senior Management and Top Management levels"*

(Commission for Employment Equity Report (CEE), 2011-2012)

The preceding statement highlights the slow pace of transformation in South Africa. Women are still underrepresented in senior and top management positions when compared to their male counterparts. The latest CEE (2011-2012) reports that men make up 80.9% of all top management positions, nearly twice their economically active demographic representation as illustrated in Figure 5. There is an increasing representation of women as the level of managerial position decreases, leading one to infer that there is a barrier, or glass ceiling, preventing more women from penetrating to top positions. Considering that women make up nearly 45% of the South African workforce, this is a dismal number when considered in the greater employment context.
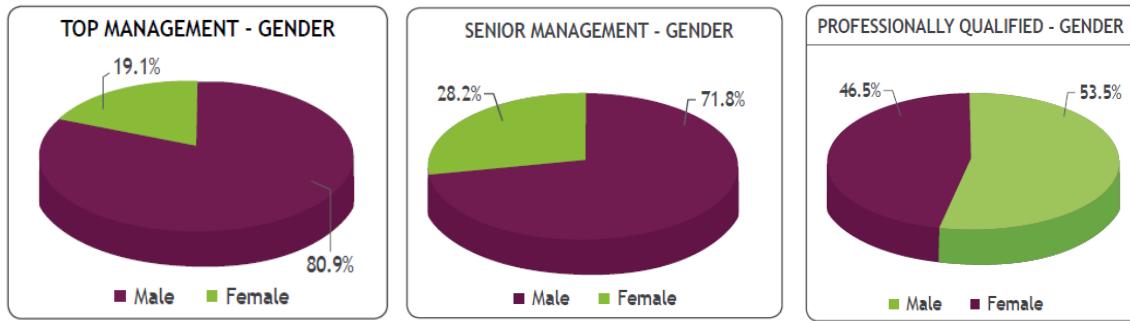
Figure 5: Workflow profile for management by gender (CEE, 2011-2012)

There has been a consistent failure in attempts made by South African employers to increase the number of women in business, particularly in top managerial positions. This is illustrated by Figure 6 that displays the growth, or lack thereof, and the changes in gender composition for top managerial positions in South Africa.

	Male	Female
2007	79.5%	20.6%
2009	81.5%	18.4%
2011	80.9%	19.1%
EAP	55.6%	44.4%
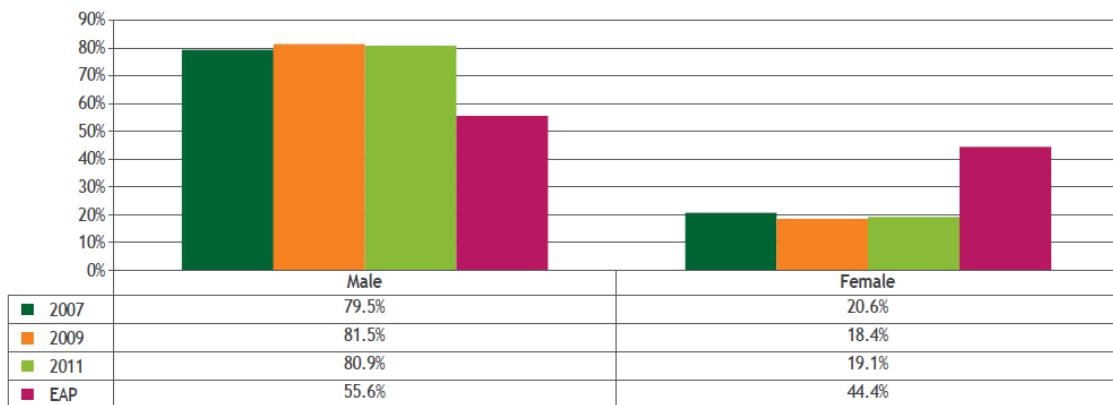
Figure 6: Trends for the Top Management level from 2007 to 2011 by gender (CEE, 2011-2012)

In this context, EAP represents the Economically Active Population and is indicative of the composition of people who are in the workforce. The succeeding Figure (7) further elaborates on Figure 6 by illustrating in a more detailed format the percentages of women in the South African workforce across three years.
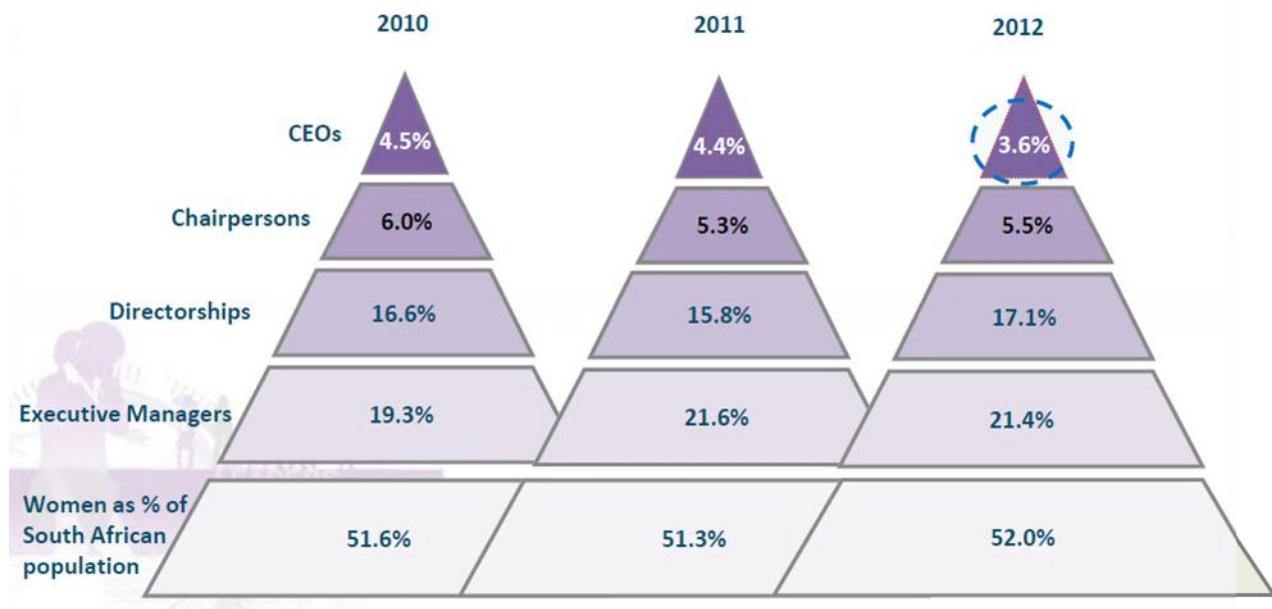
Figure 7: Census pyramid of economically active women in South Africa (BWA report, 2012)

The above pyramid is extracted from the Business Women Association (BWA) South Africa Women in leadership census 2012 and clearly indicates that 3.6% - a decline from previous years - of CEO positions in South Africa are held by women. The inverse of which indicates that the remaining 96.4% positions are held by men. The succeeding Figure (8) is a granular representation of the status of women in top managerial positions in 2012.
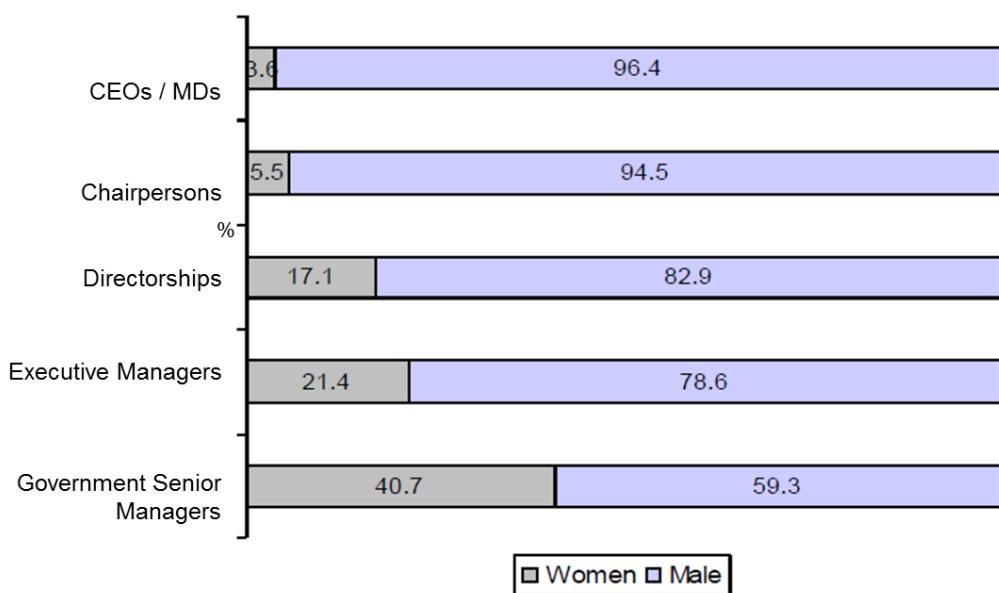
Figure 8: Statistical profile: women workforce representation in % (BWA report, 2012)

These statistics are mainly due to the oppressive past that women in South Africa have experienced. However, the picture for South Africa is not that different from the rest of the world. Legislation is mandating that women in all industries, especially mining, be fast tracked to top and senior managerial positions. The dilemma prevailing is that due to past inequalities, many women lack the qualifications necessary to perform effectively. Looking at higher education institutions in 2012, the greatest numbers of women were concentrated in the humanities and basic finance studies, while males continued to get educated in higher technical qualifications, including Science and Engineering (The State of Higher Education in South Africa , CHE, 2009). This means that the feeder pool for higher managerial positions in mining is highly male-dominated bringing into question the capabilities of women as leaders in the industry. This is clearly reflected in the mining and basic minerals industries, as can be seen from the succeeding Figure (9), derived from the BWA South African Women in leadership census 2012.
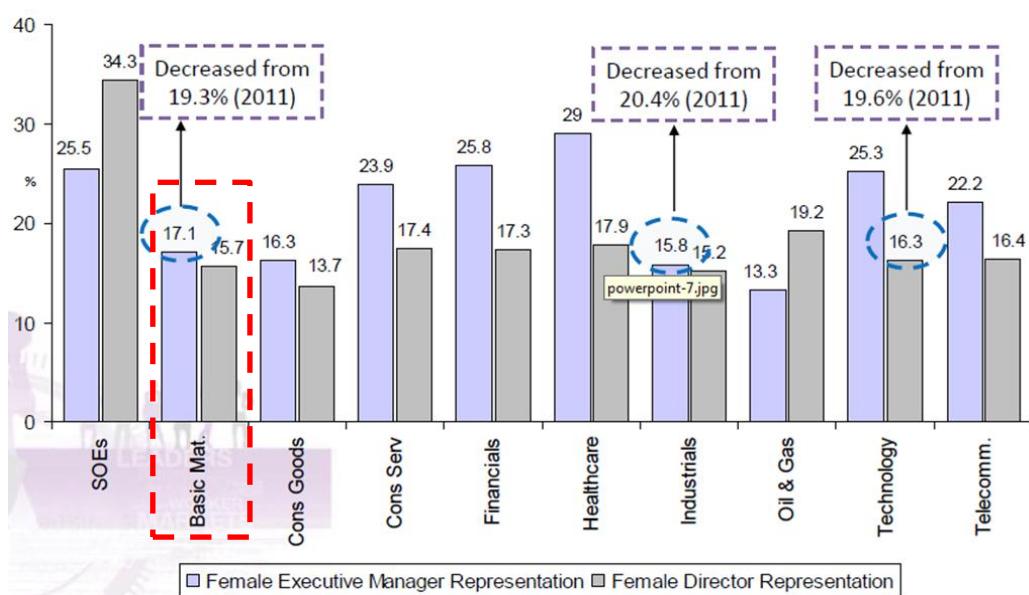
Figure 9: Women in director positions in different industries (BWA report, 2012)

The preceding Figures 8 and 9 clearly demonstrate that women have continued to face barriers when attempting to make it to the top. This indicates that although there is a drive for the inclusion of women in top executive positions, the materialisation of this ideal is far from actual realisation. Some of the barriers inhibiting women from reaching top ranks include; different organisational barriers to advancement, lack of appropriate mentors and coaches, lesser compensation when compared to their male counterparts, exclusion from

social networks that impact on the business, dual career families, gender stereotypes and limited stretch assignments (Cornish, 2007). These barriers pose a glass ceiling for women within a given organisation.

2.2.4   MEN VERSUS WOMEN IN MANAGEMENT: THE GLASS CEILING

One needs to answer the question; do men and women need the same qualities to be successful in business and reach a high managerial position? A study by Ibarra and Obodaru (2009) suggests yes; another more recent research study with similar findings is Andersen and Hansson (2011). This, however, is reported in literature to be one of the biggest traps that women leaders fall into, the mistake of assuming that they are as capable as their male counterparts and will thus reach the same point as men do in business (Vanderbroeck, 2010).

Research indicating that men and women are alike is largely irregular, as most of these surveys are conducted in male-dominated organisations that consider women to be successful in business when they manage to fit into a masculinised definition of leadership (Eagly, 2007). Furthermore, organisational members expect men and women to have different leadership styles, where men are more focused on strategy and women on task completion and relationship building. Although, these leadership qualities are different and somewhat fit into the stereotypical mould of what a woman should be, research has found that women who adopt these leadership personas are quite successful as managers (Vanderbroeck, 2010).

In contrast to adopting specific personas, some women in leadership positions tend to forego their feminine attributes and take on more masculine characteristics; in a way - do as the boys do. This has been considered as the second main trap that women in leadership fall into by Vanderbroeck (2010). Even so, this strategy has worked well for some women in the past and has been used as a tool for breaking through the glass ceiling. Research completed by Peters & Kabacoff (2002), and Kabacoff (2000), supports this view by stating that the differences found between male and woman leaders become narrower higher up in the managerial ladder, thus reducing the need to assert oneself as a woman. The more masculinised women were seen as strategic and willing to take risks, just like their male counterparts. In this respect, women in management are walking a tight

rope; if they are too masculine, they go against the societal norm of how they are supposed to act and are thus rejected, but if they are not masculine enough, they risk being seen as dependent, weak and lacking in strategic thought. Women leaders need to be careful when adopting the masculine strategy as it has been shown not to be sustainable in the long run (Vanderbroeck, 2010).

Vanderbroeck (2010) advices women leaders by stating that they should leverage the differences between them and their male counterparts, even though some researchers view this strategy to be foolish by purporting that there is no behavioural difference to be noted (Andersen & Hansson, 2011). In male-dominated industries such as mining, construction and law enforcement, being feminine can be seen by other women as a sign of weakness, and yet can actually be a sign that the leader has a strong understanding of the self. A prime example is the new national police commissioner Mangwashi 'Rea' Phiyega, who was employed by the president after the dismal failure of her two predecessors; Jacky Selebi and Bheki Cele. The fact that she is a woman was given as part of the motivation for why she got the job, purporting that her feminine, but firm leadership style was the exact remedy needed to clean up the South African Police Services (SAPS).

In addition to facing individual barriers to advancement, women also face organisational barriers. Women leaders and managers tend to face attribution bias, which is the perception of other organisational members on their performance (Vanderbroeck, 2010). Despite what the actual performance of the woman manager is, the perception attributed is often negative (Patterson, 2006). This is evident in the 21st century organisation where 360° evaluations have become a perquisite to getting promoted. Because leadership is often defined in masculine terms, those who more closely resemble those attributes will be treated more favourably than those who don't since attribution bias will highlight the positive, while obscuring the negative. Women leaders tend to make the mistake of continually asserting their capabilities and forget to manage their wider organisational image, a pitfall that was perhaps the reason Hillary Clinton lost the US presidency race to Barack Obama.

With the war for talent, organisations have legislative and business pressures to incorporate more women into their operations; however, the path to leadership and

managerial success is still difficult for women. Woody & Weiss (1994) and Hakala (2007) have identified the following as societal and organisational barriers to women advancement.

- Lack of CEO commitment to seeing women reaching the top. This is due to the fact that currently most CEOs are men and view women as a threat to their privileged position, and also, many of them doubt the capabilities of women to perform a good job;
- Negative and indifferent behaviour from other members in the organisation, including other women who doubt the capabilities of women leaders to perform at a high level. This is mainly fuelled by gender stereotypes;
- Structural barriers such as functional job assignments that may take women away from their family responsibilities;
- Those who break through the glass ceiling attribute their success to their own individual effort and hard work, and not to mentoring and coaching programs, which brings into question the value of these programs in advancing women; and
- Closing the education gap between men and women has not reduced the status difference attributed to the respective genders, with men continuing to be seen as more capable than women, and are mostly better compensated.

Another organisational issue is discrimination; although open discrimination has been outlawed by the EEA, it still exists covertly. This is felt when such programs as mentorships and coaching-like relationships are implemented. Classical psychological research has proven that people are attracted to those who are similar to them, and with the white male domination at high levels, women are left behind while their white male counterparts continue to receive career development and advancement. This also means that they are more often chosen as successors (Woody & Weiss, 1994). The issue of choosing according to merit also leads to a perception that the few who break the glass ceiling do so as tokens, allowing the company to wave off legislative pressures from the state. This in a way enforces the structures that prevent other women from reaching the top, as the token has to be first removed from the leadership position.

These individual and organisational barriers to women advancement have led to a phenomenon dubbed the glass ceiling. Glass ceiling is a term coined by Hymowitz and

Schellhardt in a 1986 Wall Street Journal article referring to invisible barriers faced by women (Patterson, 2006). The glass ceiling can be defined as a social construct that acts as a plateau that stops an otherwise successful career progression of promotions at a specific level of the organisation, normally middle management (Hakala, 2007). Although the EEA mandates that 45% of those benefiting from affirmative action should be women, the structural and societal barriers are stronger than mandates, as is apparent in the few women that make it to executive positions; refer to the succeeding Figure (10).

In order for a woman to break through the glass ceiling, they have to break through the glass ceiling taxonomy as described by Witherspoon (2009, p. 16). Once a woman breaks through one level, they have to continue and break through all the others in order to reach top executive positions (refer to Figure 10 for a visual illustration of the preceding concept).

Figure 10: Glass ceiling taxonomy (Witherspoon, 2009, p. 16)

2.3   WOMEN IN MINING

2.3.1   THE HISTORY OF MINING AND WOMEN IN MINING

Mining was initially a job for prisoners as it was very physically demanding, with a low level of remuneration. Men would work in dark and cold conditions for eight to ten hours a day. As the industrial age progressed and poverty became prominent, mining moved from being prisoners' work to general work for the lower class. As it moved from the tarnished

man to the everyday man on the street, the nature of work in the mining industry remained the same; extensively hard. Women were then "protected" from the chores of mining, as were children, through legislation. Thus, a career in mining was not a viable career option for women.

2.3.1.1 *The history of women in mining: Globally*

Legislation was passed that no woman shall work underground, which was a major hindrance for women to enter the mining industry (Mayes & Pini, 2010). In addition to legislation, miner men thought that having women underground would cause accidents and lead to their death. However, the restrictive legislation of the modern era was a relatively new occurrence, since in the early 19th century women worked underground as miners in France and Belgium. Only in the late 1800s was legislation promulgated that prohibited women from engaging in underground mining work. This was due to the growth of the middle class that raised awareness on health matters and the poor working conditions involved in mining. It became a convention adopted by the International Labour Organisation (ILO) in 1935 and officially women were not allowed to work underground as a matter of law. The complete disappearance of women from the mining world however, never occurred.

Figure 11: Women miners in the late 1800s

As time progressed through the ages, internationally, laws restricting women from working in the mining industry were slowly being repealed, even though underground work was still prohibited. This opened up mining as a viable career for women, and technical qualifications related to mining were opened for women to enrol in. The first woman in the

world to qualify with a mining qualification was Grace McDermut, in 1903 from the prominent Colorado School of Mining. She qualified as a Metallurgist and was capable of reading German, French, Russian, technical Italian, Swedish, Spanish, Romanian and Ukrainian, and was able to interpret technical data from Chinese and Japanese publications. Her expertise in molybdenum resulted in strategic ties between USA and the Japanese motor industry. She was very successful in her career.

2.3.1.2   *History of women in mining: South Africa*

During the first stages of mining in South Africa, when it was controlled and colonised by the ruling British Colony, women were excluded and restricted to working on farms as a means of earning a living (Alexander, 2007). Furthermore, the arrangement of the rural African family unit prevented women from abandoning the family and children to go work in the city like their husbands (Alexander, 2007). This meant that for a long time, South African women were essentially excluded from engaging economically in the mining industry.

The first woman to graduate with a technical mining related degree in South Africa was from the University of the Witwatersrand in 1992, almost 90 years after the first USA graduate in 1903.

Women working underground in mining were prohibited by law globally first and South Africa then followed by promulgating the following law:

* *Mines and Works Act **1911** Section 8(1)*
    * "no person shall employ underground on any mine a boy apparently under the age of 16 years, or any female"

The 1911 Mines and Works Act explicitly prohibited women from working in mines, clustering them in the same category as children, essentially incapable of protecting themselves. Further, it was considered unethical for women to be expected to work as hard as men, because they were physically weaker, thus leading to the promulgation of this act by the South African government in 1911. The latter amended act in 1991 is as follows:

- 29 -

- *Minerals Act **1991** Section 5 (32)*

>
> **Act No. 50, 1991**   MINERALS ACT, 1991
>
> (2) No female shall work underground in a mine, and nobody shall cause or permit any such female so to work except—
>   (a) females holding positions of management and who do not perform manual work;
>   (b) females employed in health or welfare services;   5
>   (c) females who in the course of their studies have to spend a period underground in a mine for training or research purposes; or
>   (d) any other females who may occasionally have to go underground in a mine for the purposes of a non-manual occupation.

Figure 12: Government Gazette, Minerals Act of 1991

In 1977, an international court judgement allowed women to work underground in mining as it was found to be an infringement of human rights to prohibit anyone from performing any kind of work (Alexander, 2007).

And as global pressures mounted, the 1991 Minerals Act was promulgated, this was an improvement on the Mines and Works Act of 1911, but still explicitly prohibited women to work underground, although women were allowed to work in other non-core jobs, such as health care, HR and administration. This Act got repealed in 1996, and mining in every respect, became open to all who choose to partake in it, whether it is in supportive or core functions.

To date, the DMR actively promotes the recruitment and retention of women in the mining industry and in 2004 set a target that by the end of 2009, the mining industry must have at least 10% of their employees as women. In some instances, women are even preferred over men, such as in operating heavy machinery as they are viewed to be more cautious than their male counterparts (Hemer, 1997; Yakovleva, 2007).

The difficulties that women face in the mining industry today are something that is "known of," although, these difficulties have not been fully documented or researched. Academia has borne witness to the promulgation of research, both in South Africa and globally,

looking at the differences in leadership performance based on gender in the corporate world and in wider society, but not so in the mining world. Researchers such as Andersen and Hansson (2011) purport that there is no difference in leadership behaviour between men and women leaders, while other researchers state that there are (Vanderbroeck, 2010), and that these differences are important for the success of women leaders and should therefore be applied in every context, including mining.

2.3.2   WOMEN IN MINING VERSUS WOMEN MINERS

Mining can be considered hard labour; it is heavy work and requires one to exert a lot of physical strength. In addition to the physical demands, it's a dangerous profession; reports of miners getting injured or even dying in the line of duty are widespread. The conditions that mine workers are exposed to are very hostile; working up to three (3) kilometres underground is difficult on the human body, temperatures are either very high, reaching 53° C or extremely low in the early single digits. By all accounts it is not an appealing profession.

Looking at these factors, the characteristics of an individual who would be attracted to the mining industry typically contradict the characteristics normally associated with women. Particularly, one would expect a mine worker to be physically strong and have endurance, whereas women are traditionally viewed as weak and in need of protection. From an organisational fit and ergonomic point of view, women are not appropriately suited for mining companies as miners (van Vuuren, 2010).

Legislative restrictions have prevented South African women from working in technical and manual jobs that mainly occur underground in mines until relatively recently. Reformed legislation has attempted to readdress general employment equity throughout all industries; however, the Mining Charter has made a concentrated effort to increase the representation of women in the mining industry through means of quotas. Another factor affecting the entry of women into mining is the general domination men. Practically translated, this means lack of facilities such as toilets, uniforms and safety wear that do not fit, rampant sexual harassment and limited accessibility to family planning facilities (AngloGold Ashanti Report, 2009).

The entry of women into the mining industry has thus far been an assimilation of women into a heavily masculinised world of sexist stereotypes and a tokenism ideology. This poses the question; is there really reform in the mining industry with regards to women? Or are the few that operate within the industry a token group? Women who entered this tough world have to display high levels of masculinity as femininity is generally considered a weakness (Murray & Peetz, 1994).

As research on women in mining progresses, an interesting distinction has begun to emerge between women in mining and women miners. Women in mining are described as those women working in the mining industry in supportive or non-core functions. This includes women working in HR, finance and administration among others. The number of these women in the industry is growing at a steady rate, mainly due to legislative pressure. On the other side of the fence are women miners. These are women who are directly involved in the core functions of the mining industry and who can be clustered into two groups; those with technical qualifications and those in lower positions who have no or limited qualifications. The number of the second cluster in both respects has fragmented growth and stands still for certain periods of time. Table 3 below summarises the distinction between the two clusters.

Table 3: Women in mining versus women miners

	Women in mining	**Women miners**
Growth pattern	Exponential growth in numbers	Fragmented growth in numbers
Role within the company	Supportive functions; HR, Admin, Finance	Core functions; Artisans, miners, engineers
Operational space	Offices and boardrooms	Field

2.4   WOMEN IN NON-TRADITIONAL CAREERS

Societal norms are a big factor in influencing the kind of work men and women choose. This ideology explains to a large extent why there is a small number of male nurses when compared to women, and relatively few women construction workers (Gale, 1994). Jobs that bear certain characteristics are appropriated to different genders. For further elaboration, nursing is a profession associated with nurturing, patience and compassion, characteristics that are normally attributed to women; whereas jobs that require heavy physical exertion are normally attributed to men. These judgments are made with seemingly no consideration of the actual characteristics possessed by the individuals involved. Prominent characters such as the former president of Harvard University, Lawrence Summers, have suggested that the root to the phenomenon may be founded in the inherent cognitive difference between men and women (Zhang, Schmader, & Forbes, 2009). This phenomenon may also stem from previous restrictive laws of hiring women into male-dominated industries from the 1930s, where if females were hired, they were dismissed as soon as they were married (Roche, 2006).

The harsh working conditions that general mine workers are exposed to, has led to a general understanding among mine stakeholders that a mine is no place for a woman (Murray & Peetz, 1994). In actuality, it is viewed as being more suitable for men. This has fuelled negative attitudes towards women in mining, and has led to very few women entering the mining industry in technical and mining positions in the past (Sohn & Lee, 2008). Women in the industry were found in more traditionally feminine roles, such as administration, finance and human resources. Considering all these factors, one can deduce that mining is a non-traditional occupational choice for a woman.

Inferences to cognitive and physical differences between the sexes has become enshrined in mining cultural belief systems and have come to be known as cultural stereotypes, and sometimes even considered as fact. Pythagoras in the 5th century BC suggested that mathematics is better suited for men as it contains abstract cognitive constructs, this has then fuelled a negative stereotype that women inherently lack math ability (Spencer, Steele, & Quinn, 1999). Inversely, women were associated with work that affects the body and routine mundane tasks (Zhang, Schmader, & Forbes, 2009). Although, women are not restricted in terms of choosing careers in fields that contain

mathematics, an underrepresentation of women in these fields, including mining, is still found (Mayes & Pini, 2010). This can be connected back to stereotypical notions of the capabilities of women related to these fields and the emergence of the infamous glass ceiling.

2.4.1   FACTORS AFFECTING CAREER CHOICES FOR WOMEN

The entry of women into the work place has been a tumultuous one; career women were often seen as selfish and bad mothers. The traditional view of women was that they belonged in the home where they were mainly responsible for caring for their husbands and children. Even when women worked outside the home, it was mainly in support of their husbands and therefore earned no income. In the minor cases where they did, it was significantly less. This traditional way of work assignment acted to disempower women economically and set a foundation where the burden of family responsibility was mainly reserved for them. Due to these family demands, women were restricted to menial jobs in domestic and clerical type work. By the late 19th century, more women were working outside the home in occupations like teaching and nursing as they were considered to require the same attributes that women traditionally possessed; meek and submissive.

The exponential growth of the world economy and the need for talent to maintain the momentum, along with a great acknowledgement for women's rights globally has led to the growth of the female labour force. Despite the increasing numbers of women in the work place, there has been a continued clustering of women in traditionally 'feminine' roles and occupations (Domenico & Jones, 2006). Even in situations where women work in male-dominated or gender neutral occupations, they remain underpaid when compared to male counterparts of comparable education and experience (Whitmarsh, Brown, Cooper, Hawkins-Rodgers & Wentworth, 2007).

Gottfredson (2005) found that children initially grow up with a positive attitude towards all occupations, but as they grow older, gender socialisation and parental influence ensues and little girls and boys are channelled into aspiring for gender appropriate occupations. Those who refuse to conform to the social norm are normally ostracised as 'the other', and it is this societal rejection that enforces the gender appropriateness of vocational choices (Koenig, Eagly, Mitchell *et.al*, 2011). Considering these factors, one may wonder if women

are given the freedom to choose from the full array of careers (Özbilgin, Kusku & Erdogmus, 2004) or if they are rather channelled into 'feminine' jobs.

A study by Behrend, Thompson, Meade *et.al* (2007) examined the choices made by medical students in terms of choosing a field of specialisation. They found that female medical students were more attracted to relationship based fields such as primary care. This brought into question the reason for the disparity in occupational choices of men and women; specifically, is it a result of biological differences or gender socialisation? Studies by Zhang, Schmader, & Forbes (2009) and Eagly & Sczesny (2009) suggest that gender socialisation is more closely linked to vocational selection than biological differences. Even in situations where biological differences can be considered a causal factor, the differences are further amplified by societal expectations.

Even though the entry of women into the workforce has seen substantial changes in the traditional 'work-is-primary' psychological contract, the prevailing paradigm in the work place remains one which is better suited for males (Shapiro, Ingols, O'neill & Blake-Beard, 2009). This means that women are fundamentally trying to get ahead in a male-dominated world. The combination of this, gender socialisation and stereotypical gender associations have kept women out of maths and science intensive qualifications and therefore jobs, maintaing the status quo and keeping industries such as mining predominantly male.

2.4.2   GENDER STEREOTYPING AND CAREER CHOICE

Stereotypes may be regarded as psychological constructs formed about various things. They act to reduce psychological load by creating preconceived ideas about certain demographic groups, thereby reducing mental strain. Stereotypes are not inherently destructive and should not be thought of as such, although they are known to have negative consequences. Research has revealed that stereotypes about suitable roles for women affect the professional aspirations of young women and their eventual career choices (Koening, Eagly, Mitchell, & Ristikari, 2011; Whittock, 2002). A continuous process of gender socialisation forms an accumulation of gender-stereotypical knowledge that influences women's interest and perception of various career choices. This pressure usually forms in early life and influences the careers young girls envision doing.

For those who are fortunate to obtain a supportive background and eventually end up in male-dominated careers, they are usually subjected to what has been termed *stereotype threat*. This is described as an uncomfortable situation women are subjected to where they are treated on the basis of stereotypical beliefs that are negatively attributed to their social group and this tends to undermine their performance when compared to the other groups (Schmader, 2002; Steele & Aronson, 1995; Barieto, Ryan, & Schmitt, 2009). These two factors combined lead women to choose careers that are approved by society for their gender, to avoid anxiety and the added burden of rebuking the associated group stereotype.

2.4.2.1   *Stereotypes from early childhood*

From an early age children are socialised to fit into their gender assignment. Little baby girls dress in pink, while little baby boys dress in blue (Eagly & Sczesny, 2009). As they enter toddlerhood, they are further socialised to fit into their gender through the items of clothing they wear and the types of toys they play with. Little girls are given dolls to entrench in them a nurturing and maternal disposition, while little boys play with cars and guns to entrench in them strength and independence. This form of socialisation goes on into adulthood as a means of communication from society on how they ought to act based on their gender (Zhang, Schmader, & Forbes, 2009).
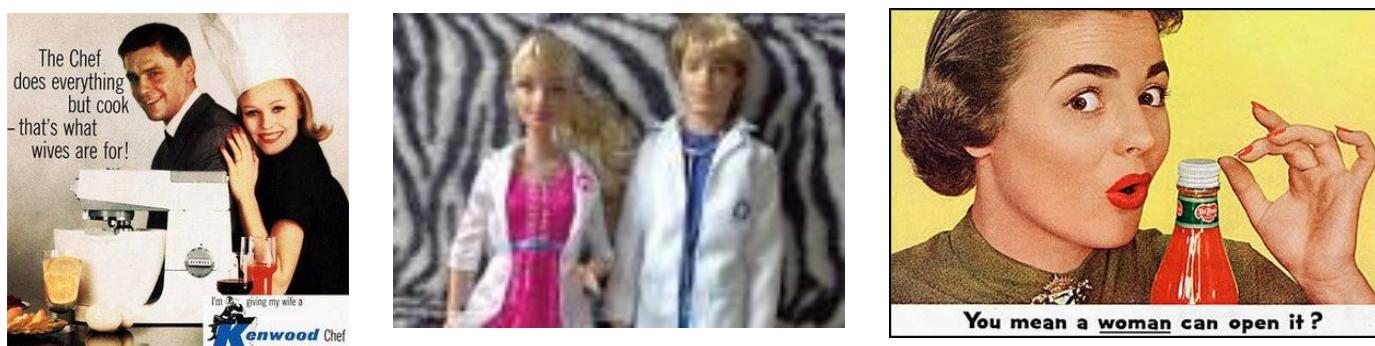
Figure 13: Images of gender bias in popular media

The above images clearly communicate stereotypical characteristics that the sexes are supposed to assume as part of their identity. The first image displays a man in a suit, indicating a professional occupation and has the caption, "The chef does everything but cook - that's what wives are for!" clearly communicating that the woman is expected to stay at home and not engage in corporate activities. The second image displays two dolls, where the woman doll is the nurse, the helper, and the male doll a doctor, more

prestigious. The last image has the caption, "you mean a <u>woman</u> can open it?" clearly communicating that women are less strong, and dependent on men. Gender bias of this nature is communicated to young children from an early age to socialise them into their expected gender roles, which is also related to beliefs about the kind of competencies and vocational capabilities possessed by the genders. This has led to a formation of patterns where one gender dominates certain professions. The mentioned factors below as detailed by Zhang, Schmader, and Forbes (2009) indicate the resulting conditions. Gender socialisation discourages women from pursuing careers in mainly male-dominated enviroments such as mining and construction. The unequal distribution and under representation of women in certain careers shape the patterns of implict association wherein a child would view nursing as a woman's profession because all the nurses the child has been exposed to are women.

2.4.2.2 <u>*Stereotype threat for women in male-dominated environments*</u>

Even for those women who choose to go against the norm and build a career in a male-dominated environment, they are still confronted with negative women stereotypes. Many women in male-dominated environments suffer from the concern that they will be judged according to negative women stereotypes, such as women having poorer math abilities. This can lead to anxiety, which may further lead to reduced performance. Even women who do not believe in stereotypes may be affected simply from the knowledge that such stereotypes exist (Steele & Aronson, 1995). This situation is threatening to women involved in male-dominated industries and has been termed by Steele and Aronson (1995) as *stereotype debt.* Thus, the situation tends to negatively affect the woman's performance which further exacerbates the perceived threat (Zhang, Schmader, & Forbes, 2009).

This can also be attributed to the desire to maintain a positive social identity for the affected group, leading to an increase in the experience of anxiety, which further negatively affects performance. Some researchers have suggested that this is due to reduced working memory capacity (Schmader & Johns, 2003). Hence stereotype threat is experienced to a greater degree by those women who strongly identify with their gender group as opposed to those who identify less strongly with their gender group (Schmader, 2002). This further adds stress to the individual concerned as they are

frightened that poor performance acts to affirm the negative stereotype of the affected social group (Schmader & Johns, 2003).

The nature of stereotype threat is situational; therefore, some situations are more likely to arouse negative emotions such as anxiety than others. Research has found that any situation that brings forth the under representation of women or the dominance of men in a particular work situation is likely to lead to a situation of stereotype threat. It is viewed as important to identify and understand these triggers since they can aid in finding a solution or a way to minimise stereotype threat (Zhang, Schmader, & Forbes, 2009). This is important since continued and consistent communication of negative stereotypes and the experience of stereotype threat creates what has been termed *inferiority anxiety* (Osborne, 2001), where the stereotype is internalised and accepted as part of one's identity (Steele & Aronson, 1995).

Research has further found that continued exposure to stereotype threat over time can undermine women's interest in remaining in male-dominated careers. However, Zhang, Schmader, and Forbes (2009) identified strategies that can be used to defuse the effects of stereotype threat. They are:

- Increasing the representation of women in male-dominated professions. Equal or close to equal representation of men and women in male-dominated fields would change the inherent perception that a certain field is only reserved for men, while another is only reserved for women.
- Increasing the representation of women in male-dominated fields of education, such as engineering and technical work. Eardley and Manvell (2006) found that the under- representation of girls in these educational fields leads to sexual segregation and discrimination running amuck, thus deterring other girls from entering those fields in the future. This also acts to build a pipeline in male-dominated professions and thus increases the number of available men when vacancies arise.
- Creating an Identity-Safe-Environment. Minimising cues that communicate gender stereotypes to young women can create a safe space to cultivate one's gender identity with minimal threat from negative stereotypes. A research study by Schmader (2002) revealed that stereotype threat affects the performance of an individual to the extent that the individual identifies with the stereotyped group.

Thus creating gender neutrality in certain careers reduces the need to strongly identify with a certain group or gender.

- Reduce the focus on testing, particularly math testing as stereotype threat faced by women regarding math ability may skew test scores, making them less scientifically reliable (Schmader, 2002).

- The education of men and women alike on how stereotypes affect behaviour and performance needs to be conducted. Stereotypes exert influence on an implicit level and thus usually go unnoticed. Differences in behaviour and performance are then misattributed to other factors such as inherent ability. Furthermore, increasing career or vocational education on the different and wide career choices that are open to young adults increases the entrance of women into a particular industry (Roche, 2006).

Most research conducted on gender stereotypes was done in the United States of America, a society that is considerably more egalitarian than South Africa's highly patriarchal society. It is therefore appropriate to deduce that gender stereotypes are more strongly and clearly communicated in the South African and wider African context.

2.4.3 INFLUENCES BEHIND WOMEN MAKING NON-TRADITIONAL CAREER CHOICES

Women are generally channelled into gender appropriate occupations such as administration, teaching and nursing, through gender socialisation and stereotyping. Some women, however, choose to go against the status quo and go into a male-dominated environment. Whitmarsh *et. al* (2007) found that women who have strong familial support are more likely to go into careers that are traditionally reserved for men. Relationships with other influential adults in the lives of young girls were also found to increase career aspirations and increase the likelihood of young women entering into male-dominated occupations (Zheng, Saunders & Shelley, 2002). Research found that young women exposed to such supportive family structures tended to have a higher level of self-efficacy and are thus were more likely to deviate from the social norm than young women who are socialised to fit their gender prescription.

Parents' career choices and level of education were also found to play a significant role in young women choosing traditionally masculine occupations. Domenico and Jones (2006)

found that the career aspirations of young girls are closely related to parental occupation. This was especially the case with mothers, as young girls were more likely to go to work with their mothers and understand the kind of work they did, thus if the mother was in a non-traditional occupation, it is likely the daughter will follow suit (Whitmash *et.al,* 2006).

Race and socio-economic status were found to influence women's career choices. White women in middle class settings were noted as more experimental with their vocational choices than other races in homes of lower income. Hellenga *et al.* (2002) found that African-American women had lower career aspirations than their European counterparts, more so if the African-America woman was from a low income setting. It was found that young women with a higher socio-economic status were more knowledgeable and enlightened about the various career options available and were more likely to choose an unconventional career for women (Trusty, 2002). Thus, a supportive family background, a career driven mother and middle to upper socio-economic background are all factors contributing to women choosing non-traditional careers.

2.4.4   THE EXPERIENCES OF WOMEN IN NON-TRADITIONAL CAREERS

Women who work in non-traditional careers at all levels tend to be more visible than their male counterparts (Whittock, 2002). Women in these industries went as far as saying that they were not only visible, but were also targets of unwanted humour and sexual harassment. This is probably because the first few women to enter a male-dominated industry are often treated as tokens or experiments, to see if women can cope in that industry. A lot of research in this field has been conducted on women in the construction industry. In the study conducted by Whittock (2002), a construction woman foreman aged 43 records the following as her experience in a male-dominated industry:

> *"When I arrived you could see boys peeping around corners and all there, looking . . . I don't know where I got the courage. Somebody said that the longest walk you ever do in your life is up the aisle. The longest walk I ever did was from the gates down to the yard in Williamson's. 'Cos there was boys every- where and it seemed to be huge."*

This shows that women in male-dominated industries consistently feel watched, whether it be literally or figuratively. Many women react to this feeling of constant scrutiny by either over- or underachieving (Gale, 1994).

The arrival of women in the industry also tends to create polarisation, with groups of employees either associating themselves as either members of the out- or in-group (Whittock, 2002). The difference between men and women is often exaggerated, and women, especially those who experience high gender identification, tend to feel a heightened need to stay close to other women in the group. Polarisation in these situations is also exacerbated by experiences of common trials, one such trial that women normally share is the experience of unwanted and insulting sexual harassment from male colleagues.

After dealing with excessive visibility and heightened polarisation, the next step is assimilation. This is described as either women taking on stereotypical women roles, such as being the mother and showing motherly care for other employees, others take on the role of the seductress (Whittock, 2002). The other reaction is to be accepted by their male counterparts, usually when they perform at a high level, and start to behave as 'one of the boys', usually done by changing their speech, social association and physical appearance. This has led to a common stereotype that women who work in male-dominated industries, tend to behave more like men then like women.

2.5   WOMEN IN EXECUTIVE POSITIONS IN THE MINING INDUSTRY

Due to the global skills shortage, or talent crunch (Blass, 2007; Blass & April, 2008; McKinsey & Company, 2001; Erickson, 2008; Bhattacharya, Sen, & Korschun, 2008; O'Neal & Gebauer, 2006), employers are forced to expand their usual talent pools ever wider. This has resulted in mining houses recruiting more and more women into mining in all disciplines, whether it be core or supportive. There is a recent emergence of women being hired into managerial positions in the mining industry. These women are considerably different from the "mining wives" described in previous feminine-mining literature (Mayes & Pini, 2010). The woman mine manager takes up a role that is highly masculinised both in terms of the leadership role she plays and the industry in which her

leadership is executed. The journey of women to the corner office started with the breakdown of gender barriers in entering the mining world. This task proved to be as difficult as that which was faced by women in confronting the world with women's ability to lead. In this modern age the percentage of women in executive positions and women in mining is small when compared to the same roles played by men.

The available literature notes the path and journey embarked on in the not so distant past, for women to be fully recognised as part of the mining community. This is mainly due to the efforts of the post 1994 government to promote equality among all creeds of human kind, which also includes the promotion of gender equality in the mining industry. This journey also includes the inclusion of women in managerial and executive teams, a battle that is still being fought by women. Exploring the path of women into the boardroom of other industries may shed light on the strategies employed by women in advancing their careers, and requires further inspection.

Considering the factors that prevent women from advancing in their careers, particularly male-dominated careers, women mine managers have felt the need to denounce their femininity and opt for gender neutralisation (Eagly, 2007). This in an attempt to be taken more seriously by their male counterparts who have been exposed to ideologies that characterised the mining world as inherently unsuitable for women (Murray & Peetz, 1994). The challenge specifically lies in the fact that women are constantly trying to move away from the "token" identity that is attributed to them because of their gender. They assert that they have reached success, because they are capable as leaders and not because they are women. This woman mine manager paradigm does not aim for gender reform in the boardroom, but rather for gender neutrality, where the focus is on merit and performance and not on the social factors that contextualise the job.

In insisting on gender neutrality, the modern woman mine manager is inveterately ascribing to masculine ideologies as she is aiming to perform well in a role defined through masculine attributes. These include attributes such as strong, disciplined, assertive, technically minded, competitive and controlled. Women mine managers feel patronised when addressed in endearing terms or when approached in ways that comply with the societal norms of dealing with women. Another big factor is that of sexuality, where women

feel that they have to forsake their sexuality, in all ways, in the board room in order to be taken seriously by their male counter parts. Forsaking traditionally sensual women attire is important to such women as they feel that it further advocates gender neutrality (Murray & Peetz, 1994).

2.6   SUMMARY

Extant literature has identified the important role societal norms play in gender prescriptions for career choices of women. It also points to familial influences on women's career choices. Historically, women were not viewed as leaders or managers in any industry, more so, in the male-dominated mining industry. This traditional view, mainly fuelled by societal constructs, has led to the underrepresentation of women in top ranks. The mining industry further prohibited women from working in the industry in technically related fields. The journey from the past to the unstable present state has been the foundation of this literature review. The literature confirms that very little research has been done on understanding the life and career journeys of women who have made it into leadership positions in the South African mining industry, and virtually nothing is known about the new cohort of young women who have earned professional qualifications in mining.

Women have faced a tumultuous journey to the boardroom, especially in the mining industry. From being the supporting wife of the miner to being the executive manager of the miner in question is a road that has proven both challenging and fulfilling for those who have travelled it. Women who have made it to the top and broken through the glass ceiling wish to exert their capabilities and intelligence and not their gender. This situation has led to women striving for gender neutrality and not for gender reform. This literature review has explored the journey of women through the mining industry and certain themes have been identified. It is these themes that are likely to reveal themselves as the study continues.

CHAPTER 3:RESEARCH DESIGN AND METHODS

3.1 DESCRIPTION OF INQUIRY STRATEGY AND BROAD RESEARCH DESIGN

3.1.1 INTRODUCTION

The succeeding Table (4) gives a brief summary of the methodology used in the study for information collection and processing. Aspects of the Table will be delved into individually in more detail in the rest of the section.

Table 4: Summary of methodology section

Section	Description
Research paradigm	Social Constructivism
Research approach	Qualitative
Inquiry strategy	Inductive qualitative approach
Research design	Life story methodology
Sampling method	Purposive sampling
Target population	Women working in the South African mining industry in a management or professional position
Target sample	• Older women in senior or top managerial positions (general managers and EXCO) • Younger women with a technical mining qualification
Number of participants	8 women in total • 4 older women • 4 younger women
Information handling	• Collection of data through life story interviews • Audio recording, analysis and reporting
Rigor and Quality of Research	Pretesting and interview protocol,

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	Trustworthiness, credibility and transparency
Ethics	• General research ethics: Confidentiality and consent letter • University of Pretoria ethical guidelines

3.1.2 RESEARCH PARADIGM

The word paradigm comes from the Greek word *paradeigma,* which means to plan, and describes a method of framing or adopting an all-encompassing world view. Paradigms play a pivotal role in social science research as they influence the manner in which the design is approached and how the data is interpreted once obtained. The research paradigm in this study falls under social constructivism. This paradigm views reality as best understood by studying and observing the manner in which people perceive, experience and understand the events in their own lives and those of others. This paradigm acknowledges that there is no single state of truth as experience of a phenomenon is subjective, thus bias is an expected and permitted aspect of conducting social research. The removal of bias through interpersonal detachment is an obstacle to obtaining rich information collected through collaboration and mutual learning between the participant and the researcher. As such, factors related to the positivist view, that there is only one universal truth which is proven through noting factors such as reliability and validity will not be addressed in this paper (Klenke, 2008)

3.1.3 INQUIRY STRATEGY

Mouton (2001) describes four non-empirical research designs, namely; conceptual analysis, theory-building studies, philosophical analysis and literature reviews. With conceptual analysis, the author aims to clarify or elaborate upon ideas and their intended meaning. The author goes into the detailed study of the concept in order to obtain complete understanding. Theory-building on the other hand is focused on adding to an existing discipline new models and theories that have previously not being discussed, thereby creating new knowledge. Philosophical analysis aims to dissect phenomena to understand the philosophical values of the argument from various positions. Lastly, literature reviews are aimed at analysing the literature available on a specific subject and

then drawing trends that seem to arise. This allows the author to then draw conclusions on the subject at hand (Moyo, 2010).

The study relies upon an inductive qualitative approach. It began with a review of trends that have emerged in literature on the study of women in non-traditional careers, and mining women in leadership, and then used life stories to illuminate the experiences of women in the South African mining industry. Thus, the aim was to add knowledge to a missing segment in the women in leadership research, particularly looking at women in leadership positions as well as those aspiring to such positions within the mining industry.

As the study acquired life stories and analysed them, there was no construct being studied in the traditional sense. The researcher aimed to acquire the information as stated and draw trends or similarities from the life stories told. This meant that constructs that emerged during the course of the study, were further studied to the extent that they enriched the study. Generalisability was not an aim, as the purpose of the study was explorative in nature; to understand the life stories of the women who participated and not intended for application in other contexts aside from the context that the study was conducted in.

3.1.4   RESEARCH DESIGN

The life stories of great leaders have captivated the world as far as leadership is recorded. From the great Julius Caesar to the iconic Nelson Mandela; life stories of leaders have always intrigued the world's population. People are drawn to them, seeking to uncover the social factors that have driven them to their point of greatness (Scott Ligon, Hunter, & Mumford, 2008). This string of great life stories has led to an archetypical picture of what a leader is to be constructed in the minds of many, including a list of traits and behaviours that one needs to display to incite followership in others. Additionally, people want to feel like they can embark on a similar journey and end up at a similar point of greatness in their own lives. This has led to the life story methodology. This methodology uses life stories and narratives as a means of collecting information on a subjective and sometimes of a sensitive nature. The personal nature of the life story methodology made it suitable for information collection in this study as the collection of data involved obtaining the very essence of the individual; their life story.

3.1.4.1   *Life story interview*

The research design of the study is the life story methodology, with the main instrument of data collection being the life story interview. The life story interview is used by qualitative researchers to gather information as it allows insight into the psyche and history of an individual (Bertaux & Kohli, 1984). The father of Psychoanalysis, Sigmund Freud, also attributed early life experiences and their articulation through life stories to who a person becomes later on in life (Scott Ligon *et al.*, 2008); thereby making the life story interview a better instrument for data collection than a general in-depth interview. The life story interview is a specific type of in-depth interview that consists of open-ended questions, spanning over approximately one and a half, to two hours, where the individual gives a summary of their life, but goes into detail about critical incidents (Bertaux & Kohli, 1984). The interviews in this study spanned from (the shortest being) an hour and (the longest lasting) an hour and 20 minutes, thus sticking to the general guidelines given. A semi-structured interview protocol was used in this research study. However, each interviewee was allowed to tell her story and the protocol was used as a guideline for the research to avoid skipping over major parts of the participants' lives as well as questions that were relevant and important to the study. The interview protocol is available in Appendix C.

The researcher started the interview by explaining to the participants that the interview will follow the format of a conversation, and they should not worry about trying to provide the 'correct' answers or using the right words. This was done with the aim of increasing the participants' level of comfort, thereby allowing them the freedom to speak openly. Life stories can be considered self-narratives, in the same way that interviews are self-narratives conveyed orally (McAdams, 2001; McAdams, 2006).

Life stories can also be acquired through personal journals and diaries, social artefacts, autobiographies and tape & self-video recordings. As none of these were available to the researcher during data collection, they were not considered as viable sources. The researcher was however, in possession of the participants' resumes that she acquired from company information databases where available. This was used for the triangulation of information as their resumes provided information on their educational background as well as their career paths.

In order to guide participants through the interview and encourage open dialogue, the researcher started all the interviews by introducing herself and briefly sharing aspects of her life and career.

The interview questions were all open-ended, taking the form of a conversation between two parties as opposed to a formal meeting, with an appropriate amount of probing applied where necessary. Interviewees were also encouraged to share particularly poignant aspects of their life stories to enrich the quality of the study. The interviews were recorded using an audio device available on the researcher's mobile phone, and were transcribed at a later stage by a professional transcribing and proof reading service (Maree, 2011). The interviewing process also required the researcher to have certain competencies in order to be able to effectively extract information from the participants, particularly active listening and probing.

3.1.4.2   *Justifications for research design*

Story telling can be traced back to the beginning of human history wherein stories were the only way that some societies conveyed information across generations. The Southern Africa Bushmen and Khoi-san drew their stories on cave walls, while Egyptians recorded theirs inside the pyramids they build. Thereby, making sure that their history transcends their own death and carries on through time. Traditionally myths and folktales fulfilled three functions; they helped to bring accord among us and others, bring accord within ourselves, try and understand the mysteries of life and the mysteries of the universe (Atkinson, 1998).

Telling others stories is a basic condition to human behaviour. We think and speak in story form, thereby using stories as a form of information gathering and sharing adds meaning to the phenomenon under study and also to our lives. In order for the message to be conveyed through a story, a specific pattern needs to be adhered to as this forms the plot of the story and aids the story-teller in remembering the essential elements of the story (Atkinson, 1998). Story telling has developed further into life story telling, or life narratives, wherein an economic summary of one's life is conveyed and then recorded (Scott Ligon *et al.*, 2008). The researcher chose the life story methodology as it is the most appropriate means by which to structure an in-depth interview for the kind of information collected in this study. This methodology also offered sections in which the researcher

could categorise the information obtained from the individual. For example, breaking up the information into early childhood and adulthood wherein vocational information and other information was considered.

Identity can be defined as an internalised life story (McAdams, 2001, 2006, 2008; Shamir & Eilam, 2005). Erickson in 1963 proposed his now famous research of the eight stages of life development; the fifth stage of identity versus role confusion is of great importance to narrative psychology. Normally occurring in adolescence or young adulthood, it is at this time that people search for their own life stories as a means of exploring vocational and life choices. Through consolidating their beliefs and life experiences, the individual forms an identity through internalising his or her own life story, a story that will largely influence that individual's subsequent choices. This sense of identity is then reconciled with the greater socio-cultural environment, wherein the individuals define themselves in terms of cultural systems (McAdams, 2001). It is this connection between life story-identity-choice that gives the understanding and conveying of one's story the power to insight awe in ourselves and in others, as they relate it to their own life stories. This adds a therapeutic aspect to life-story telling for those listening and the individual telling the story.

The life story interview was appropriate because the purpose of the research was exploratory in nature, aimed at understanding the women's journeys towards a career in a male-dominated industry. The researcher did not have clearly defined constructs at the onset of the research, but rather aimed at discovering them through the course of the research. Research has also found that managers prefer to be interviewed as opposed to completing a questionnaire, as it allows them to reflect on events without needing to write them down (Maree, 2011). Additionally, the life story interview requires first hand recording in order to maintain accuracy, as the participant may also not remember the exact events of their own life because of memory distortion and selective memory and perception. The nature of the questions asked is also of a sensitive nature and open ended, making the entire process lengthy. The combination of these factors made the choice of the interview in particular appropriate for this study (Saunders, Lewis, & Thornhill, 2009).

Additional advantages of using the life story interview as documented by Saunders, Lewis, and Thornhill (2009) include:

- Interviews, especially indepth interviews provide the researcher with a wealth of rich information that is especially valuable in conducting qualitative research. Since the study is qualitative in nature, using other instruments of information collection such as survey or observation would have been inappropriate. Considering the personal and intimate nature of an individual's life story, it was appropriate and beneficial for the researcher to optimise this advantage.

- Helps in building rapport between the researcher and the participant, which was necessary for the participants to feel comfortable enough to share their life story with the researcher.

- The face-to-face interview also allowed for the researcher to observe the participants' body language, which can be a revealing aspect in obtaining qualitative information.

3.1.4.3   *Limitations of the research design*

As with every instrument, the life story interview has its limitations. These were the limitations the researcher identified and kept in mind while conducting the interviews. The first is human memory. Human memory is selectively perceptive and weakened by time. The participant may not remember important points in their own life or may remember them incorrectly. Other times they may divulge information in one session that they may choose not to divulge in another session. This may be important secrets that shaped the course of their lives that they do not want to be widely known, such as an addiction or an extramarital affair. Another problem is that the researcher has limited resources to verify the information provided by the participant, as the participant may be offended if the researcher wants to interview other people to corroborate the information given, and the third party - such as a spouse or parent - may also have limited information (Atkinson, 1998).

The researcher also faced challenges obtaining appointments with the participants as some of the participants were reluctant given the method of information gathering. A life story interview is notoriously time consuming, and this deterred some of the professionals and managers in the older cohort of women, who are generally busy with their jobs and

family responsibilities, from accepting to participate in the study. The women in the younger cohort were more accommodating. Some of the older women were more reluctant and only agreed after persistent communication from the researcher and study supervisor. Once the participants agreed to be interviewed, they were widely dispersed across the country, necessitating time consuming and expensive travels for the researcher to come into contact with the participants, the furthest being located in Lephalale. This limitation presented a particular obstacle because the nature of the research made it nearly impossible for the researcher to delegate the interviewing to a third party. The researcher mitigated this problem as much as possible by targeting people in the researcher's immediate vicinity, or those that could be found within a 200 kilometre radius of the researcher's workplace or residence. This was not always possible, as the researcher had to travel more than 200 kilometres on more than one occasion. As there are no widely known remedies for the above-mentioned obstacles, they were considered limitations.

3.1.5   SAMPLING

3.1.5.1   The sampling method and process

The final sample consisted of four women in senior managerial positions – two white and two black women, and four younger women – all black, who had selected a career in mining by indication of their educational degrees. The sample was gathered using a purposive sampling strategy. This was done using a non-probability approach, which was described by Sanders *et al.* (2009) as a haphazard manner of selecting a sample that is the most convenient for the researcher. This entails that the researcher targeted women she knew fell into the two cohorts. The second cohort of younger technically qualified women was not a challenge for the researcher to obtain as there was an accelerated increase in the number of women fitting this profile entering the job market and the researcher was already well acquainted with young women who fitted this description. The first group of older women was more challenging to find as there are a fewer number of women fitting this profile that were firstly, available and secondly, that the researcher was familiar with.

The researcher knew two of the women from working in the same organisation and used that as target strategy. The other two women, the researcher had met while attending a

conference on women in mining to gather information. She then took down their contact details and communicated with them via e-mail at a later stage. Snowball sampling was initially planned as a sampling strategy, but all the leads given did not transpire into an interview. The reason for planning to use this sampling method was because the target population was difficult to find as most of the women work in obscure mining towns. Fortunately, the researcher was able to find all eight women through purposive sampling.

The researcher approached potential participants through e-mail and gave them a brief introduction to the study using the letter contained in Appendix B. The letter briefly outlines the purpose and process of the study for the participant and that the researcher was available should the participant feel that they needed more clarification on any matter relating to the study. The participants were afforded the opportunity to engage with the study supervisor should they have needed further information that could not be adequately supplied by the researcher.

Participants, who declined to join the study, were thanked for their consideration and no further action was taken. There was only one woman who declined to participate. When the participants chose to partake in the study, the researcher initiated a telephonic conversation with them, and sometimes with their assistants to set up a date and time wherein the researcher and participant could meet to conduct the life story interview at the convenience of the participant. This proved to be quite a challenge as many of the older women had very busy diaries and in one case, the researcher had to wait three months to get an interview with a participant. A confirmation e-mail was then sent to the participants post the telephonic discussion to confirm the agreed upon date and time. A reminder e-mail was sent a day or two ahead of the agreed upon date and time of the interview to ensure that the participant was still available and willing to continue as initially discussed. This was also done to prevent any unnecessary travels and time wastage. After the interview, an e-mail was sent to the participants, thanking them for their participation. Some of the participants asked for the transcripts of their interviews, and these were given to them.

3.1.5.2 *Target population*

The target population of the study were women working in the South African mining industry, in particular two types or cohorts of women. The first cohort targeted older women, mostly over the age of 40 - even though this was not used as a discriminating factor - in managerial positions in any mining company in South Africa. The goal was women holding senior and top operations management positions within their organisation. The second cohort targeted was younger women with any mining and engineering related technical qualification or degree. The initial target group was young women with specifically a mining related qualification; these qualifications typically include Mining Engineering, Mining Technician, Rock Engineering or Mine Surveying. The main reason for targeting women with mining-related qualifications was that these women had chosen mining at an early age. This differentiated them from other technically qualified women in the mining environment, such as Electrical, Mechanical and Industrial Engineers, who always have the option to enter another industry.

The ideal sample of four older women in operations-focused management and four younger women with specifically mining-related technical qualifications was troublesome to obtain. The researcher could only find two participants per cohort that fit the initial target sample. Thus women in other technical fields were recruited into the sample for the younger cohort and women in the older cohort who held senior positions in mining companies although not in operations were also considered. It is difficult to assess if the change in sample had a dramatic effect on the study results, but the impact of the alteration is somewhat mitigated by the premise that the objective of the study is to understand life stories and not to generalise or predict. Race and other characteristics of the women were not considered as discriminating factors, even though their impact on the results was considered. As such the women came from a multitude of background and the racial mix was two White and six African. This can also be attributed to the demographic dispersion of the country.

3.1.5.3   *Justifications of sample*

This sample of women fitted the description of the target sample except in the case of the younger women having a specific mining-related qualification and the two older women who are not managing an operations driven division. Despite this, the participants were very open and very honest to the process and communicated sensitive information that was of a deeply personal nature. At no point did they start to rush the process, even when the interviews went over the allocated time. This allowed the researcher to obtain the necessary information.

3.1.6   DATA HANDLING

3.1.6.1   *Data collection*

As previously mentioned, data was gathered using a semi-structured interview termed the life story interview. The flow of the interview was guided by the interview protocol found in Appendix C. This was to gather basic and necessary information from the participants, while still allowing them the freedom to delve into stories they felt had been significant to their lives and that were of relevance to the study. The interviews took place in a location that was the most convenient for the participants, but one that is also conducive for interviewing. The locations were thus chosen on the basis of them being comfortable, quiet and neutral. This was also intended to increase the comfort level of the participants as previously stated. The participants' offices were used most of the time, with one occasion having the researcher visit the participant at her home, and another where the participant preferred to conduct the interview at the researcher's home. This was aimed at allowing the participants to feel free enough to divulge sensitive and sometimes personal information they would otherwise not communicate, but that is necessary to uncover and understand, for the richness of the study.

The approximate length of the interview ranged from an hour to one and a half depending on the depth of answers the participants chose to give with an appropriate amount of probing from the researcher. All the interviews in the study were solely conducted by the researcher to minimise variance, other biases and common errors as much as possible during the data collection phase. The interview protocol followed a chronological sequence

through the lives of the participants and dealt with matters such as early life and education, young adulthood and looking to the future.

3.1.6.2   *Data Analysis*

The interviews were taped with an audio recording device available on the researcher's mobile phone. The device recorded the entire duration of the interview. The audio device was pre-tested by the researcher and the sound quality ascertained to establish that the chosen device adequately fulfilled its purpose; otherwise an alternative device would have been used. After all the relevant information was gathered, the interviews were transcribed into word documents by professional transcribes sourced by the researcher to ensure the highest quality and to mitigate time wastage. In addition to the words spoken, the transcriptions needed to give the reader an idea of the tone the participant used and non-verbal expressions as far as reasonably possible (Sanders *et al.*, 2009). Once the transcripts were returned to the researcher, the researcher and an independent second person read through the transcripts respectively to ensure high quality.

Once all the interviews were transcribed into word documents, processing began. The first step taken was to think back to the interviews conducted and note the themes present throughout all the interviews on memos, available in Appendix G. Once these were established, the researcher used the analysis program *Atlas.ti* to code the data. The analysis of each interview then commenced. Analysis was done using thematic analysis supported by *Atlas.ti*, wherein the interviews were thoroughly analysed to derive patterns that emerged when the interviews were compared with each other.

As constructs began to develop and become salient, the code list expanded and the trends began to appear across various interviews; the code list in question is available in Appendix D. Inductive reasoning and qualitative thematic analysis were used to understand the individual stories in a holistic and chronological manner in line with the chosen research design; the life story methodology. Inductive reasoning involves looking at individual cases and then collating them to discover if and how they fit into an existing theory or constitute new insights. Thereafter, the different codes were grouped into different themes, and these themes formed the basis of the results presentation that follows. The themes are presented in the succeeding results chapter.

The researcher relied solely on the transcriptions when coding the interviews to ensure data integrity (Saunders *et al.,* 2009). In light of this, the transcriptions were read several times by the researcher to note core themes and the emotional undertones that were not immediately noticeable. As mentioned, qualitative coding software was used to code the data. *Atlas.ti* is well-known software that was used to speed up the coding process and the cost was considered attainable.

3.1.7 ASSESSING AND DEMONSTRATING THE QUALITY AND RIGOUR OF THE STUDY

Table 5 below contains details of eight criteria a researcher needs to consider when establishing rigor and quality for qualitative studies (Tracy, 2010). The key aspects of quality measures for the study are described in the sections that follow.

Table 5: Eight criteria for excellent qualitative research (Tracy, 2010)

Criteria for quality (end goal)	Various means, practices, and methods through which to achieve
Worthy topic	The topic of the research is: • Relevant • Timely • Significant • Interesting
Rich rigor	The study uses sufficient, abundant, appropriate, and complex: • Theoretical constructs • Data and time in the field • Sample(s) • Context(s) • Data collection and analysis processes
Sincerity	The study is characterized by: • Self-reflexivity about subjective values, biases, and inclinations of the researcher(s) • Transparency about the methods and challenges
Credibility	The research is marked by: • Thick description, concrete detail, explication of tacit (non-textual) knowledge, and showing rather than telling • Triangulation or crystallisation • Multivocality • Member reflections
Resonance	The research influences, affects, or moves particular readers or a

	variety of audiences through: • Aesthetic, evocative representation • Naturalistic generalizations • Transferable findings
Significant contribution	The research provides a significant contribution: • Conceptually/theoretically • Practically • Morally • Methodologically • Heuristically
Ethics	The research considers: • Procedural ethics (such as human subjects) • Situational and culturally specific ethics • Relational ethics • Exiting ethics (leaving the scene and sharing the research)
Meaningful coherence	The study: • Achieves what it purports to be about • Uses methods and procedures that fit its stated goals • Meaningfully interconnects literature, research questions, findings, and interpretations with each other

3.1.7.1 *Pre-testing the interview protocol*

The first step in ensuring the quality of the data collected was to do a pre-test of the interview protocol drafted by the researcher. This qualified as a pilot test, wherein the researcher simulated an interview with a neutral third party. This was to ensure that the answers are not staged to depict the study in a more appealing light. This also allowed the researcher to observe and thus anticipate the reactions of the participant to specific questions and to estimate the amount of time required for the interviews. This further allowed the researcher to refine probing questions, the manner in which the researcher communicated to participants, and ascertain the quality of the audio equipment.

3.1.7.2 *Trustworthiness and transparency*

The researcher needed to ascertain that the information gathered was trustworthy, or that it had integrity. This was done firstly by pre-testing the interview protocol. This allowed the researcher to anticipate certain reactions from the participants and thus probe for answers when the participant needed direction. The second aspect was accurate transcribing. Since the transcriptions formed the basis of coding, they needed to be as accurate as reasonably possible. The researcher ensured this by having the transcriptions professionally transcribed and then listening to them audibly, while reading the transcripts, and also asked a colleague to do the same. Corrections were made to the transcriptions where necessary. The third method of increasing trustworthiness was through using qualitative coding software, in this case *Atlas.ti*.

The researcher also requested a fellow post-graduate student (an independent coder) at another university to double check the coding by going through an interview using the coding list to code the interview. When the researcher's coded interview was compared to the interview coded by the independent coder, there was a high level of similarity with only a few differences that the researcher and the independent rater discussed and resolved. Thereafter, some adjustments were made to the codes.

Triangulation of information in the interest of providing more than one source of data was also used. Research into the participants' career journeys was independently conducted by the researcher and also information from the interview was also used to compile a resume for each participant. The information sources included a Google search, media reports and company websites. Information was available more for the older, than the younger women. After compiling a short resume, the researcher sent them to the participants to verify that the information was correct. This was done to minimise administration for the participants as some of them have been working in the same company and same position for a long time and may not have had an up-to-date Curriculum Vitae. These resumes document each participant's career path. All the participants responded positively in this regard. All resumes are available in Annexure F.

Transparency was ensured through an accurate and full description of the methodology and analytical procedures used in conducting the study. The academic community is free

to request access to the research proposal, the resulting research report, the transcriptions and the audio recording that were collected during the process of the study and any other information that is not restricted by a code of ethics. The academic community is also at liberty to replicate the study and will receive the full cooperation of the researcher in the event that this becomes reality.

3.1.8   RESEARCH ETHICS

3.1.8.1   _Researcher's general ethical responsibility_

Ethics are always a consideration when conducting a research study, as it is the researcher's responsibility to ensure that no negative consequences, either to humans or the environment, arise as a result of the research study. The following principles were considered by the researcher during the research study, in order to ensure the study was conducted ethically. These considerations by O'neil (2010) were taken into account:

Voluntary participation: the choice to participate in the research study was left entirely to the participant. At no time was participation in the research study an obligation or mandatory. The participant was also at liberty to discontinue participation in the research study at any time. This was communicated to participants beforehand. The researcher ensured this by stating it clearly in colloquial English on both the invitation to the participant and the informed consent form. Additionally, this was orally communicated to the participant, should clarification be requested. This was further ensured by being open and approachable to the participants at every step of the research study and providing them with any information relating to the study that is not restricted by an ethical code of practice. It was also clearly communicated to the participants in both written and verbal formats that information can be requested, such as a literature review to augment their own understanding of the subject content should they have wished to have done so.

No harm to participants: the researcher should ensure that no harm shall befall the participants as a result of their participation in the research study. This is done by the researcher ensuring the participants were made aware of all possible negative consequences, whether physical or psychological, and communicating them beforehand to the participants. Further, the research proposal and interview protocol was submitted for

ethical clearance which was approved by the Department of Human Resource Management Ethics Procedure.

Informed consent: The participants were aware of the intent of the study and their role in it. They were further informed of what will happen or what might happen with the results of the research and the potential benefits or risks that may be the result of the research study. The researcher did her best to ensure that this was adequately communicated to the participants and record of this was kept. Each participant completed a consent form prior to the life story interview. Appendix B displays the letter of informed consent that was used to ascertain this.

Anonymity: the participants had the right to remain anonymous and they were assured that the responses they gave would not be used to identify them in anyway. This included omitting the name, ID number and other personal information that may be used to identify participants. All of the participants were given pseudonyms ensuring their real names were never used in the study.

Privacy and confidentiality: personal and private information must be treated as strictly confidential and not divulged to a third party under any circumstances. Due to the nature of the research, personal information was masked to ensure anonymity and will be used only in an academic and professional manner.

3.1.8.2   *The University of Pretoria code of ethics*

As a researcher under the umbrella of the University of Pretoria (UP), the researcher had the responsibility to comply with the code of ethics of the University. Like other researchers in the world, researchers at UP are expected to strive for the highest standard of excellence and morality in any research activity. Along with the right researchers have to academic freedom, UP researchers have the following responsibilities:

Social responsibility: researchers form part of the broader South African society and should be cognisant of that fact when conducting research studies.

Justice: the fair treatment of all individuals within society, whether they choose to or not to participate in any particular research study.

Benevolence: in order for research to be ethical, participants should not only be protected from harm, but steps should be taken to ensure their wellbeing. This aspect also communicates that research studies should be embarked upon with good intentions or good will.

Professionalism: since the researcher is representing UP and the profession, they should conduct themselves in a professional manner, including dress and speech.

Refraining from discrimination and other inappropriate behaviour: the researcher should not engage in behaviour that may bring UP or the profession into disrepute, and should thus refrain from unfair discrimination, sexual harassment and general disrespect.

3.2   SUMMARY

This chapter explored and presented the research paradigm, approach and design of the current study. The life story methodology was presented as the method of data collection, with the life story interview as the main data collection instrument. The techniques utilised and choices made were explained and justified. The trustworthiness and transparency of the study methodology were then explained, followed by ethical considerations. The subsequent chapter will explore the results obtained by applying the methods presented in this chapter. The results align with the research objectives presented in the first chapter.

CHAPTER 4:RESULTS OF THE STUDY

4.1   INTRODUCTION

This chapter presents the results obtained from the analysis of the interviews conducted with the participants. The major objectives of the analysis were firstly, to understand the life stories of two cohorts of women working in the South African mining industry. Specifically, to uncover what drew them to a career in mining. Secondly, the sample consisted of women in managerial positions and those newly employed in the industry with technical qualifications as potential successors, thus gaining a snapshot of the mining leadership pipeline. Thirdly, the analysis was aimed at understanding how early life experiences and other influences affected the vocational decisions the women made later in their lives, particularly looking at exposure to gender stereotyping in early childhood. Finally, identifying the strategies used by the women to overcome or cope with the career obstacles experienced and the effect this had on their future aspirations was explored.

As noted in the previous chapter, the analysis was conducted with the aid of the qualitative analysis program *Atlas.ti.* The transcribed interviews formed the basis of the analysis as trends were noted and similar codes attached to the trends. A number of themes emerged and these are presented in this chapter, to maintain the holistic intent of life stories as a methodology; brief portraits are provided for each of the eight women in Appendix E. These portraits use pseudonyms to protect the women's identities. Certain factors of their life stories are provided in general terms so that no specific information could lead to the disclosure of their identities.

4.2 EARLY CHILDHOOD INFLUENCES ON CAREER CHOICE

The analysis revealed a rather complicated picture of early childhood influences. Figures 14 and 15 capture this complex set of influences. Figure 14 reflects the setting or external environmental factors the women were exposed to as children. It consists of three main themes, namely; socio-economic status, familial structure and gender role socialisation. Figure 15, on the other hand reflects themes that emerged as a result of the interaction between the environment and the women in early childhood. Thus, the women had some choice in how they responded to these factors. The latter component of the theme consists of the state of familial relations and experience of family support.
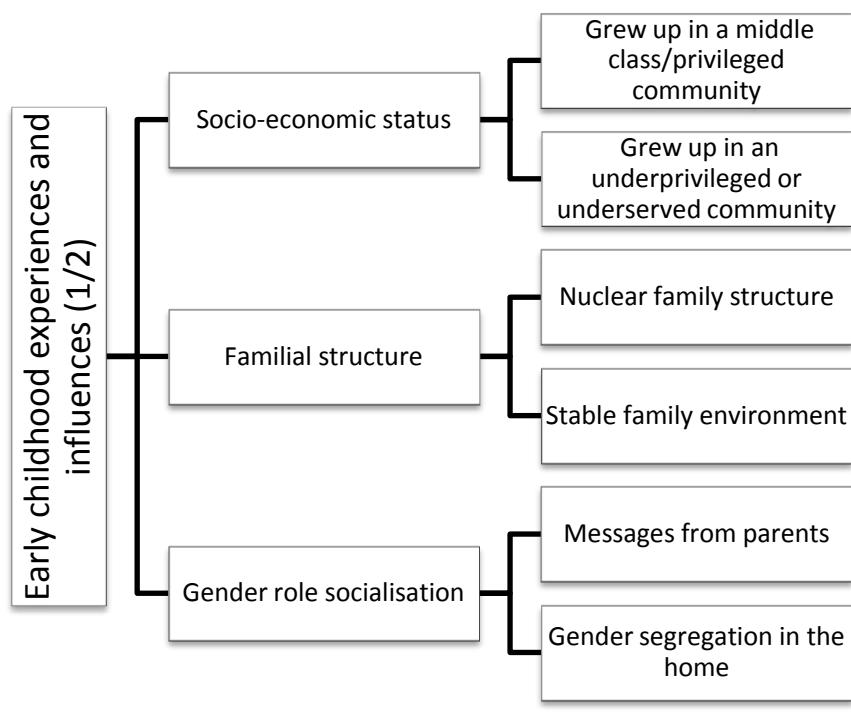
Figure 14: Environmental factors present in participants' early childhood
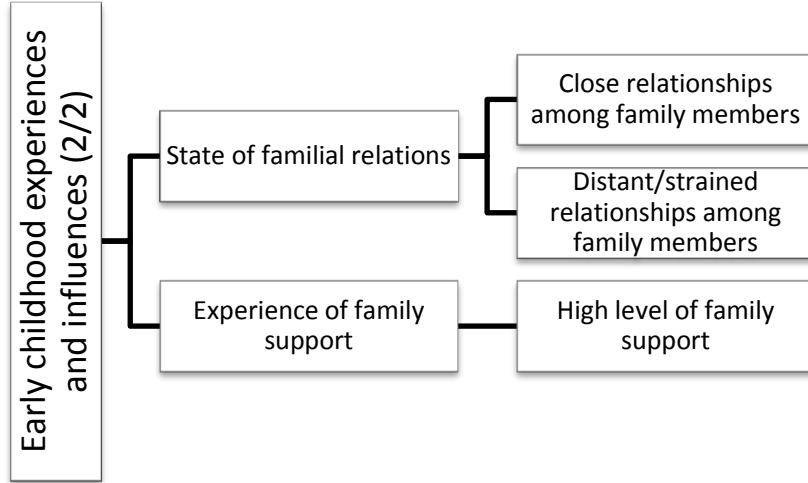
Figure 15: The result of the interaction between the childhood environment and the participants

The preceding Figures 14 and 15 illustrate the two components of the early life influences on career choice theme. The first component illustrates socio-economic status, familial status and gender socialisation as a setting for the type of childhood environment the participants entered. These factors then set the scene or the context in which the participants' childhood played out. Within this context, the state of familial relations and the level of family support played an important role. Two types of relationships emerged from the interviews; close and distant relationships among family members. However, the ways in which the participants interacted and responded to these familial relationships was more important (See Figure 15). All the participants also reported a high level of family support from either their parents or siblings. In cases where a participant had a strained relationship with one family member, this was counteracted by a close relationship with another.

4.2.1   SOCIO-ECONOMIC STATUS AND FAMILY STRUCTURE

Most of the participants grew up in a township or rural area, an environment which could be considered underprivileged or underserved in terms of access to amenities and facilities. One of the participants elaborated on this when she stated:

> *"No, it's a township. It's like…It's not too rough like Alex [laughing], yet it's not too… safe as well. It's just a normal township, with normal township people who like socialising and everything… mmh"*

- 64 -

In addition to this, some of the women also reported experiencing financial hardships. Notably, these were the same women who reported the possibility of high future income as a motivator to enter the mining industry. Most of the participants reported a nuclear family structure and a high level of stability in their childhood, with the occasional house move. It can thus be concluded that the participants came from a varying spectrum of lower to middle class families that were nuclear in structure resulting in a high level of childhood stability.

The participants experienced varying degrees of closeness in their relationships with family members, including relationships among family members. Despite reporting this, all the participants asserted that they grew up in a supportive family environment and were always encouraged to aim for high academic performance. Matlatsi elaborated on how supportive her father was during her formative years.

> *"My father, I liked him a lot. My father liked education even though he wasn't educated, he did whatever he could. The little he earned, he made sure we ate at home, got clothes and a better education. We went to a public school and the education wasn't that good but he made an effort to take us for extra lessons and Saturday school. He was a very good man but very strict, he put rules down but I liked him. He was strict and it was for the best; I could have been something else due to peer-pressure and doing things because of it. Had it not been because of him, I wouldn't be what I am today."*

4.2.2 GENDER ROLE SOCIALISATION

Most of the women reported receiving clear communication of gender norms at a young age in the home. They observed the role their mothers played and associated that with what kind of behaviour was appropriate for men and women. The story of Nokwanda is exemplary of what was generally heard among the participants. She reported on the gender discrimination she experienced in her childhood, where her father told her that she is to only pursue education as a career endeavour, since she will not carry the family name. This was also a product of the era in which she grew up; the 1960s. She elaborated by stating:

"As much as he was an educator; he was a principal. He became the Inspector of Schools, after being a Minister of Education. In his mind, because of gender differences, I had a special or a different role to play as far as the economy than my brothers did. He found them to be guys who were supposed to be bright, who were supposed to get Degrees and all of that but for us, all of us as girls, he actually wanted us to go and do a Teacher's Degree. He never saw us going any further than that, but through hard lessons in life I think he learnt from it. And he used it every time he spoke; in any occasion where he spoke. He actually used this as an example to say, "Please don't be like me. Don't lock your girl children from their dreams." That was a very big eye opener for me. Even before I could walk out and start fending for gender rights, yes, it was already clear to me. Even mothers, in our culture sometimes, they've got that preference of boys over girls because there is this belief that you are going to leave the family in any case, which doesn't always work like that these days. You become the rock of the family at the end of the day, which I am now. So, yes, that was the first time I really realised that, "You know what, you've got to really work hard, prove yourself as a woman, that you are as good as the boys..."

It is clear from Nokwanda's elaboration that she was less regarded in her home because of her gender. Even though she went on to prove that she was worthy of a high education, the battles she faced as a young woman with her father stayed salient in her mind throughout her adulthood.

The women who reported experiencing gender discrimination in their childhood also recalled experiencing gender role socialisation from one or both parents. Nomfundo stated what her mother taught her about being a woman, and more so, being a lady:

"Well I can't even tell you when because you are raised by a mother who believes in those things; that you are a girl. You've got to, as I've said earlier, you must act like a lady. We had to do certain chores in the house. Funny because the boys were the eldest in the family; I remember I used to love eating my brother's bread. He used to knead bread and make bread for us so even though we were boys and girls and they were the eldest in the family they did female chores but there was also that message that you are a girl and you've got to do certain things that boys don't do."

The two components of early childhood experiences have been explored in the cases of all eight women. Although the setting of their childhood mildly varied, their interaction with their childhood environments was similar among the women in both cohorts. The differences mainly flowed from familial interactions, differing degrees of closeness among family members, and the degree to which the women experienced gender role socialisation in the home between the two cohorts. The older cohort received clearer messages of gender role socialisation and was expected to conform to their gender assignments more so than the younger cohort. It can also be noted that the women in the older cohort grew up in the age of the boy child, which also explains the higher level of gender socialisation they experienced, even though it did not always directly translate into gender discrimination.

4.3   BASIC EDUCATIONAL INFLUENCES

The basic educational influences theme discusses the participants' education from the time they entered primary school in grade one to when they completed their basic education in grade 12 or matric. The theme first assesses the quality of education the women received based on the type of schools they attended. Secondly, gender segregation within the school environment is dissected, and lastly how they experienced the interaction with their schooling environment follows thereafter.
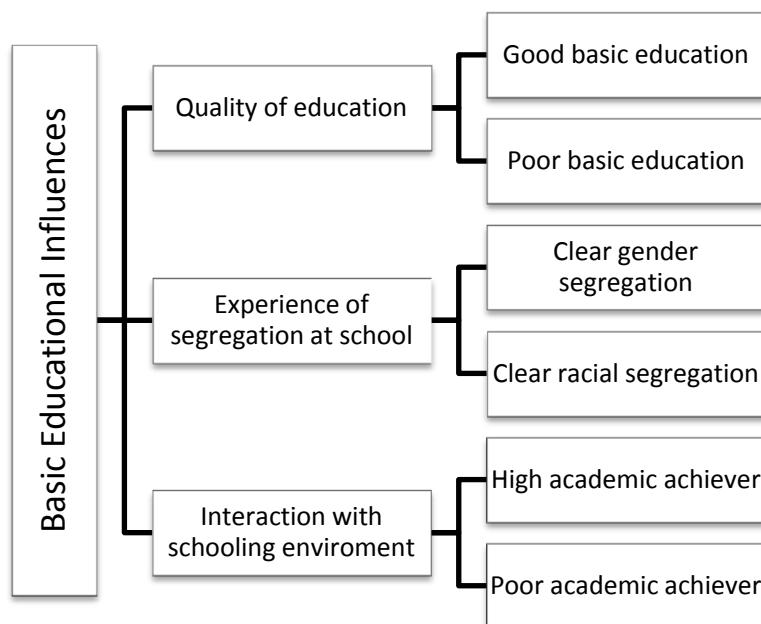
Figure 16: The components of the Basic Educational Influences theme

The preceding Figure (16) illustrates quality of education, experience of gender segregation and the interaction with the schooling environment as factors that created a platform for influencing career choices. This theme is also where the women reported making vocational decisions as they decided on which subjects to pursue in preparation for entering tertiary institutions. This stemmed from what they believed to be their biggest passions.

The quality of education varied among the participants, and as expected, correlated with the general socio-economic status of their family. Those who grew up in a township or rural area, went to underserved schools near their homes and those who lived in middle class dwellings went to better schools; although they did report that the schools were not elite. The words of Lerato, who grew up in a township north of Pretoria, capture the essence of the general memory of secondary schooling experiences in a township for the participants who went to underprivileged schools:

"…they didn't teach us anything at school. I had to teach myself most of the stuff because when you go to a township school you must just have that discipline of teaching yourself. We never finished the syllabus. I remember an English novel we had to read; we only read one chapter of it in class [laughing]. Maths…I think we did only half of the syllabus, the rest of the syllabus I had to teach myself. The teacher doesn't rock up most of the time or the teacher is on leave and there is no replacement or when the teacher is sick there is no replacement. Because I remember in matric we chilled for like three months with no Maths teacher. So every Maths period we would just sit outside and talk [laughing]. The teachers are like really lazy".

Participants from middle class environments reported receiving a good education. Jill shared what was typically recalled by the women who attended good schools, not elite ones. The quality of education was at a higher level than most schools. This is how she elaborated on the subject:

"It was a fairly well-respected school that was there, but you know, not like private; not high-end…Ja. Just run-of-the-mill. Most of the parents of my school-friends were you know the accountant and the attorney. They weren't uber-elite people,

you know. It wasn't private, but nevertheless it was really about a good grounding – a good class education and things like that".

Most of the women reported limited gender segregation, despite racial segregation being part of their schooling years. They reported having attended mixed schools where boys and girls were treated equally, other than the obvious physiological differences and socialisations where boys and girls have different bathrooms.

Despite differences in the quality of education, all of the women reported performing well academically and being recognised as high achievers from a young age by their teachers and peers. Matlatsi who grew up in rural Limpopo recounted her performance nostalgically:

"My achievements made me who I am today, they made a name for me in Jane-Furse, and I was one of the best performing kids at school. I represented the province at the Maths and science Olympiads, the recognition built my confidence."

Most of the participants both older and younger women followed this trend and reported performing particularly well academically. Didi went on to mention that she received five distinctions out of six modules, which, like Matlatsi, made her feel validated and empowered.

Despite the quality of education and degree of gender segregation experienced by the women in their varying basic schooling environments, all of them left matric with exceptional grades and an array of vocational choices available to them. This reiterates that entering the mining industry, was not a matter of necessity, but a deliberate decision on their part.

4.4   TERTIARY EDUCATION

Tertiary education deals with the education participants received after they completed Grade 12 or matric. This theme delved into the choice of university and the reasoning behind it, the quality of education at that institution and the participants' social life while studying. A clear pattern relating to the reason behind choosing a specific institution of study could not be established. In all the cases, the women knew what they wanted to study and for the most part, participants saw choosing a university as a pragmatic decision that did not involve a lot of emotional investment. There was great variety in how the women chose their tertiary institutions. For example, Lerato chose where to study because it was close to home, whereas Matlatsi had waited too long to apply to a university and she was left with the last option in addition to a host of other reasons, she stated this during the interview by saying:

> "I wanted to go study at Wits but I received no response from my application. I was told that UP was tough and needed hard work, I wasn't confident in myself and my performance. I went to UJ because it was my last option and mine survey was only offered by UJ."

Two other participants' choices were based on which environment they felt would suit their personalities best; whereas another participant's decision was made for her since her father was a lecturer and one of the benefits was that the staff's children received a free education at that university. Yet two others shared a unique factor as they both wanted to attend the University of Cape Town, but because of the apartheid laws of the time, they were restricted to "black" universities. One of the participants elaborated by stating:

> "It wasn't actually a decision. I wanted to go to Cape Town but I didn't get accepted. I did not get what was then called ministerial consent because we were supposed to go to black universities and you got special permission to go to a white university".

Even where the institution came before the course, the participants stayed in the same broader field of study. They asserted that the choice of institution had little to no influence on entering the broader mining related field.
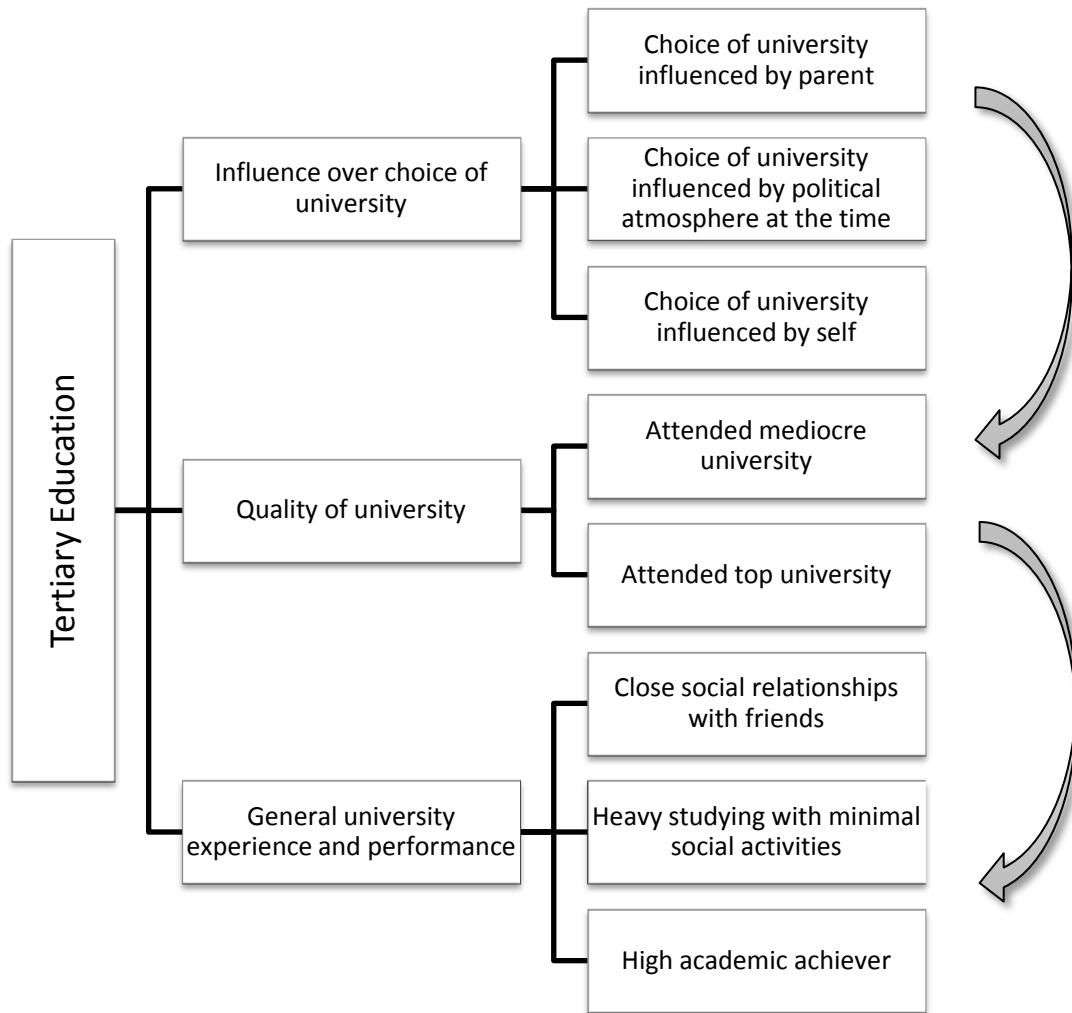
Figure 17: Tertiary education theme indicating the flow of events

Superficially speaking, the quality of education received at different academic institutions should vary, but even so, the validity of the qualification obtained at the institution is not brought into disrepute because of SAQA standards. For those participants who were forced to study at traditionally "black" universities, known for poor quality education, they were both able to get scholarships to pursue both a masters and a PhD degree at top universities in the USA. This nullified the earlier effects of second class education at the previously "black" universities. The succeeding Table (6) illustrates the participants' major fields of study and current organisational position.

Table 6: Participants' field of study and current job titles

Participants in the study	Major fields of study	Current organisational position
Lerato Masemula	*BEng (hons):* Electrical Engineering	Electrical Engineer in training
Matlatsi Manono	*Btech:* Mine surveying	Mine surveyor in training
Sue Pinache	*NDip:* Chemical Engineering	Executive at mining company
Diditle Ledwaba	*BEng:* Industrial Engineering	Industrial Engineer in training
Masindi Raluare	*BEng:* Mining Engineering	Mining Engineer
Jill Smith	*PhD:* Economic Geology	Senior Manager mining innovation
Nokwanda Jele	*PhD:* Biotechnology	General Manager of operations in Captive region
Nomfundo Madlala	*PhD:* Biology	Senior advisor health and hygiene

Most of the women reported their university experience as a positive one, full of close social relationships with friends. The participants mentioned staying in student accommodation, or accommodation close to campus. This was the first time in their lives they lived away from home. Masindi elaborated by stating the following about her social connections in university:

> *"I think so, but, we were all doing the same thing, you know same course and it was quite demanding so we would study, and then when we have time after everything is done, we would go out, you know. I enjoyed my varsity Life. I had good friends."*

A majority of the participants also reported a high level of academic performance during their tertiary education, which was a continuation of their earlier academic success. The high level of academic success is what attracted Anglo Vaal, a mining company, to Jill, becoming her entry point into the mining industry. She stated the following during the interview:

> *"I went to the University of Port Elizabeth and did great, was head of the geology students' organisation on campus and we became the biggest on-campus organisation. I won chairperson of the year – society chairperson of the year for stuff and doing stuff on the campus, but unfortunately – or fortunately – I was also*

academically strong and I was in the top 3 of my geology class and the big mining companies from Johannesburg would get tired of Johannesburg in the winter and think 'oh well, let's go to Durban, PE and Cape Town and do this like tour around the coastal towns just to see if we can pick up any good students whilst we do this'. So that's what companies at the time did… there was a company called Anglo Vaal; that's what they did. They had this road trip and they interviewed the top 3 students in each academic year or the final year and second-final year and I was interviewed. I made the short-list and then I was flown up to Johannesburg to do all the testing for the bursary. So then I was awarded a scholarship by Anglo Vaal which is a mining company."

Lerato recalled the following about her academic achievements in university:

"Academically, when I got my diploma and Btech with distinction, my parents were happy and I was also voted best student by Exxaro."

4.5   CAREER CHOICES

This theme deals with the reasoning behind the participants' career choices. It relates both to the choice to enter the mining industry and their careers before they entered mining, in particular referring to the older women cohort. Career choices are a circular theme, as the women have to first make vocational choices, and then set their goals. Sometimes the goals they set earlier in life do not hold true later in their lives and new choices and goals are made. As such, the women were constantly going through a period of goal redefining and goal setting. To track the women's career journeys and to triangulate information, the participants' resumes were also considered.

Motivations stated for career choices varied greatly among the women. For some of the participants, those who reported a slightly impoverished upbringing in an underprivileged community, possible future income was a big motivator. For majority of the other women it was connected to what they enjoyed doing in their spare time. Jill stated that one of the reasons she went into geology was because she enjoyed nature and the outdoors, she elaborated by stating:

"I'll do nature conservation and my father said to me – that was still the time where there were the Technikons and the universities – and because my father was a professor at the university, his children get free education. That's like…you know, the salaries might be less but the perk of the job is that your children don't have to pay tuition. So he said to me 'no, you're not going to go and study nature conservation at Technikon, you have to go to university where I am and your education will be free'… Ja, you know. And so that's what happened. So then he said 'you can always do that nature conservation thing later, but rather just do a basic BSc; some chemistry, some physics, some botany, some zoology, some geology and that's what you will do"

All the women in the younger cohort expressed interest for either mining or engineering because they knew a distant relative who was doing something connected to the field. Through their own accord, they researched further to explore if it would suit them, but this was not the case for the older cohort. For the older women, choosing science or engineering was related to high academic performance during their schooling years which allowed them a variety of career options.
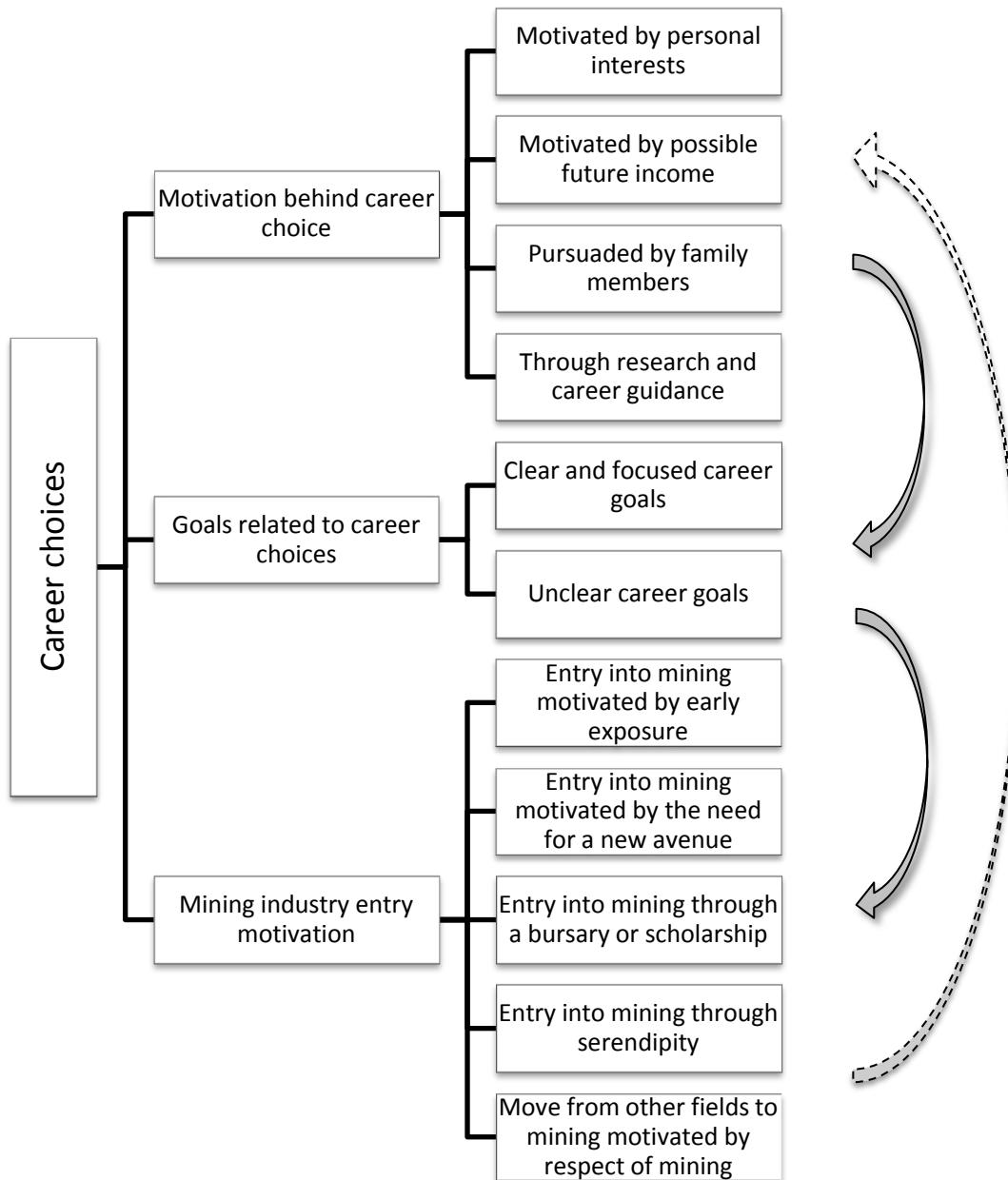
Figure 18: Career choices theme indicating a circular flow of events

The preceding Figure (18) illustrates the circular relationship among the elements of the theme as discussed above. The participants reported constantly going through a period of career choice and goal redefinition in and around the mining industry. The narrative of Matlatsi revels this iterative thinking about career choice among the participants. Matlatsi, a mine surveyor, shared the following about her career choices and goals:

"I want to get my mine surveyor certificate of competency, and then be a senior surveyor. My plan is not to be in the mining industry forever; by 35 I should have my own business and be a lecturer."

The motivations that brought about entry into the mining industry are very closely correlated to the motivations behind career choices, especially for the younger women, as this has been their only work experience. Masindi stated the following when explaining how she chose a career in mining engineering.

"I went through the book, and okay, I found engineering. I was like okay, engineering maybe it's not so bad, and that's when I started wondering what engineering I can do. My friends were choosing mechanical, whatever and stuff. I asked myself why are they always choosing those ones, mechanical, electrical and anything, and then okay. I saw mining, and okay, maybe mining is interesting, and then I read about it, and okay, you work underground and everything, but I didn't have a picture, because I never looked at mining before. Okay, let me choose mining, and I chose mining… but I knew that my cousin. I had a cousin who did mining engineering so he was getting a lot of money, different things he was buying and everything so, I asked him about it and he told me that no, it's a good field. So, I did have a background, even though I didn't ever, like go into a mine and see how it looks there, but so, hearing from him."

The above quote illustrates that the influences behind her vocational choices are by in large similar to why she entered the mining industry. She was firstly motivated by a personal interest and possible future income. She further consulted and was persuaded by a family member to enter the field. Other participants entered mining for many different reasons, with almost half of them reporting a scholarship or bursary. Didi elaborated on her entry into the mining industry by stating that at the time, it was the only way she could get funding for tertiary. She stated:

"It was a bursary thing for me. I got a bursary with a mining company… Yes but I think because I really needed a bursary, if I had another option, you know if I had a company approach me which had better to offer. Better to offer in terms of more versatility you know, then I could have been out of this industry, I definitely would

have chosen that company, but because I really needed a bursary at that time, and this company was offering me a bursary then, I just took that."

From the above quote, it is evident that Didi does not have a resounding passion for the mining industry. It happened to be a situation she found herself in because she needed funding. Sue, on the other hand, reported being exposed to the environment at a young age as she grew up in a mining village. This created within her an interest and a passion for mining. She even chose to attend a technical high school to better align herself with her mining interests. She elaborated by stating the following:

"So basically I grew up in that typical sort of small village, sort of a mine village-power station orientated village. From there I matriculated from a technical high school in Witbank".

There are two distinct groups that emerge in this theme: One group has a passion for the industry and consciously chose to build a career in the industry. The remaining participants entered the industry through serendipity, and do not have a strong passion for mining.

4.6   CAREER

The career theme deals with the participant's career in general, both in mining and in other industries before mining. It tackled matters of their level of hierarchy in the organisation, the manner in which they experienced career progression and how they have generally experienced their careers thus far. The succeeding Figure (19) illustrates this graphically.

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                                                        ┌──────────────────────┐
                                                        │ Career progression   │
                                                   ┌────┤ through affirmative   │
                                                   │    │ action               │
                                                   │    └──────────────────────┘
                          ┌────────────────────┐   │    ┌──────────────────────┐
                     ┌────┤ Career progression ├───┼────┤ Career progression   │
                     │    └────────────────────┘   │    │ through my           │
                     │                             │    │ organisation         │
                     │                             │    └──────────────────────┘
                     │                             │    ┌──────────────────────┐
                     │                             └────┤ Career progression   │
                     │                                  │ through personal     │
                     │                                  │ accomplishment       │
                     │                                  └──────────────────────┘
                     │                                  ┌──────────────────────┐
                     │    ┌────────────────────┐   ┌────┤ High current career  │
                     ├────┤ Career            ├───┤    │ achievement          │
                     │    │ accoplishments     │   │    └──────────────────────┘
                     │    └────────────────────┘   │    ┌──────────────────────┐
  ┌────────┐         │                             └────┤ Middle level in      │
  │        │         │                                  │ organisation         │
  │ Career ├─────────┤                                  └──────────────────────┘
  │        │         │                                  ┌──────────────────────┐
  └────────┘         │    ┌────────────────────┐   ┌────┤ Challenges experienced│
                     ├────┤ Career building and├───┤    │ by both genders in   │
                     │    │ gender             │   │    │ the workplace        │
                     │    └────────────────────┘   │    └──────────────────────┘
                     │                             │    ┌──────────────────────┐
                     │                             └────┤ Challenges experienced│
                     │                                  │ only by women in the │
                     │                                  │ workplace            │
                     │                                  └──────────────────────┘
                     │                                  ┌──────────────────────┐
                     │    ┌────────────────────┐   ┌────┤ Balanced work stream │
                     └────┤ Work-life balance  ├───┤    │ with adequate        │
                          └────────────────────┘   │    │ personal time        │
                                                   │    └──────────────────────┘
                                                   │    ┌──────────────────────┐
                                                   └────┤ Busy work streams    │
                                                        │ with little personal │
                                                        │ time                 │
                                                        └──────────────────────┘
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Figure 19: Career theme indicating four major components comprising the overall theme

When addressing the career theme, one has to divide our cohort of women once again into cohorts based on age and work experience. The younger women were highly limited in their work experience. With the exception of Masindi who had three years work experience, they all had been in the industry for a little over a year. They had only worked in one company and their experience of the mining industry was limited to that one company. On the other hand, the older cohort had vast working experience in and out of the mining industry and some of them were among the first women to enter mining in the operations side.

4.6.1   CAREER PROGRESSION AND ACCOMPLISHMENTS

When probed about the manner in which their careers progressed, all the women from both cohorts felt that in many instances, affirmative action helped to get them in the door. They also further asserted that they had to work hard none-the-less since affirmative action did not result in their success. Nomfundo articulated it well by stating the following when referring to how affirmative action played a role in her career progression:

"Look, I think I got opportunities because there were windows. The scholarship to America for example, was a Ronald Reagan initiative because they were struggling to diversify and the other option was to recruit from South Africa. They then put this funding in place, which enabled people to go to school and I think their vision was to have an educated group of people that would be able to come back to South Africa, when the change comes, to be able to contribute positively. So, yes, and it was aimed at mainly black South Africans. So that was the one. The second one was getting into the University South California, was at a time when the US had affirmative action policies favouring black people or trying to push more black people into the system. So although I was not American, but I got in because I was black but my supervisor always said to me, "that's only a door opener. Once you are inside it is the same. You have to work as hard if not twice as hard as anybody else." So that is how I've always treated it as the opportunity to walk in."

The participants felt that affirmative action afforded them opportunities and thus acted as a door opener. Despite this, the women stated that they were successful in their careers because they were firstly able to enter into the right organisations, and secondly due to their diligence. To this end, Jill, who had been sent by her current employer to complete a PhD at the Colorado School of Mining, uttered the following:

"And that's…the CSIR, it is that type of organisation, undoubtedly, that supports people who self-drive their careers. When they offered me a senior position, I agreed on condition that they would pay for me to do my PhD in the US, and they did".

The two cohorts had differing answers when referring to their current level in the organisation and their level of achievement in general. The women in the younger cohort were all in professional positions within the company and could be classified as middle management. The women in the older cohort were all in senior positions, with Sue being the CEO of a mining company. Given their respective ages, all the women were highly accomplished and had been recognised by their own organisations and in some cases, external parties as such.

4.6.2   CAREER BUILDING

The participants were of the opinion that women and men generally face different challenges when building a career, but that these challenges were further intensified by the polarising effect of the mining industry. The patriarchal culture present within the industry made the participants feel like they were not just representing themselves as individuals, but their social group as women. This feeling incited a sense of endurance within the women which led to the sentiment that women are better able to persevere once they start building a career because they tend to face more challenges, and this makes them more resilient than their male counterparts. Sue stated this by saying:

> *"At the age of 28, I managed 60 males and I started to empower females within the production side because I feel that women are the best team workers ever. We don't get easily side tracked like the males; they get frustrated in their work".*

4.6.3   WORK LIFE BALANCE

The subject of work-life balance was divided according to cohort among the women. The younger cohort felt that their work demands were manageable and left adequate personal time for them to explore other interests. The other women felt that they worked too much and needed more balance in their lives. This could also be explained by the level of responsibility as one progressed in their career. The older women are more senior and thus have greater career demands then their younger counterparts who are only at the dawn of their careers. This finding was also related to the age and family responsibility of the women. The older women have their own families that demand more of their time than the younger cohort who do not yet have children. Matlatsi, a participant in the younger

cohort who is currently unmarried with no children, felt that she is able to maintain a good work-life balance. She reiterated the following during the interview:

"No, there is nothing that stopping me from balancing my work and family; I get enough time to do both."

4.7   MINING CAREER

Mining career as a theme explores the women's career within the time specifically spent in the mining industry. For most of the women, this has been their entire career. The challenges they have faced in the industry, including the strong stereotypes about the kind of women who enter the mining industry, sexual harassment and their ambitions within the industry are all uncovered as part of this theme.

4.7.1   CHALLENGES OF BEING A WOMAN IN MINING

When we started speaking about the challenges of being a woman in mining, the women felt that a lot of the time, their gender had been a point of contention, where their abilities were questioned because of it. Didi, who is a young engineer, who had recently started at one of the company's biggest mines, stated what was generally heard from the women in the study about being a woman in the industry:

"When I started my orientation in the pit, I used to go on this huge truck and you know, there was a whole lot of direct and verbal, what can I say; under-estimation, like 'what are you doing here'. 'You can't do this'. 'This is an environment for men, you can't even get on that truck you know, you are too small, and you are too weak'. You are too this, you are too that, so you had to prove yourself. I can't say I have got a degree in engineering. I kind of have to physically, you know, do the physical challenge of saying you know what, let me show you, you will see, which is possible that I couldn't have been able to get on that truck, so how do I prove to that person? Now how do I, how do I make him think I am capable of anything?"

- 81 -

Nokwanda added by stating that men in the industry generally tend to see women as employment risks. When she was put into her current position, the company thought of it as a risk. She asserted the following during our interview:

"When a male appoints you, he thinks that he's taking a risk by appointing you because you may fail. You are going to fall pregnant".

Figure 20 illustrates the different categories of experiences and perceptions the women shared about being a woman in mining.
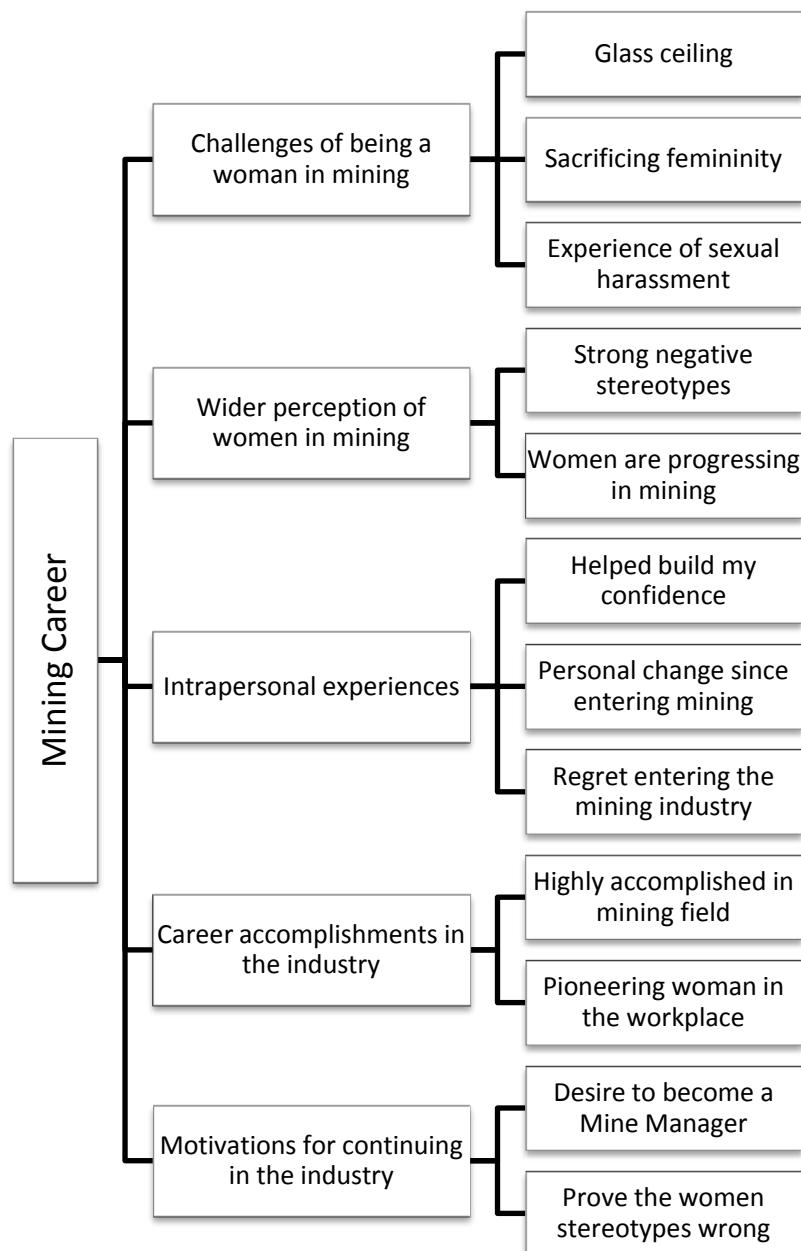

Figure 20: Mining career perceptions and experiences

Many of the women were of the opinion that because of the perception that women are not suited for mining, their careers were delayed and some even felt that their careers have hit a plateau; the proverbial glass ceiling. This left the women feeling frustrated and sometimes angry, holding the contention that if they were to exit the industry; their careers may progress at a more satisfactory rate. Nomfundo articulated it this way:

> "Because then you get angry that when you were at school nobody says, "It's okay, you can get lesser grades because you are a woman." But suddenly in the workplace and you are looking at salaries it is not the same and the benefits – "oh but you shouldn't have that benefit. Doesn't your husband have it?" It's got nothing to do with my husband. I'm employed as an individual".

Nokwanda added, that if she were a male, she "would have been given the opportunity to be on the operations side sooner" than she was. As did Masindi, who felt that she was the perfect candidate for a production manager position, but got passed over because of her gender. This was a very sensitive subject for the women. In addition to being looked over, the women also felt vulnerable, as most of them reported having experienced a significant amount of sexual harassment. This has led most of the women to feel the need to forego a certain level of femininity to draw less attention to their gender on the mine. During my conversation with Jill, she told a particularly poignant story about her early days in the industry when she was still stationed on a mine. She shared the following story:

> "This one time I was travelling underground, so it was double cages and when I got…the situation on the locomotives was that…because you sit on the locomotives and the guys with their knees apart to fit more people in. So their knees interlocked and the sort of – once again unspoken agreement – the same way I had my place in the cage; the agreement was that I would get onto the locomotive first and sit right at the end – the grating, and so I could sit with my legs together and then the next guy would sit in and then they would start interlocking their knees from me, and that was just… it was never spoken about. It was just the way it worked in the respect that I was there. But this guy that I didn't trust with his eyes. One day he came in next to me and forced my legs open and he put his legs in and he moved up and he like shoved his knee and he said to me 'I've always been looking forward to sitting like this with you'.

4.7.2   WIDER PERCEPTION OF SOCIETY OF WOMEN IN MINING

Because of such hardships and the physical demands of the job, a strong stereotype has developed about the kind of women who enter the mining industry. Women in the industry face mockery from wider society for entering the industry; sometimes even being referred to as homosexuals. This makes it hard for the women, as they do not want to be seen as 'butch' or unfeminine. Nomfundo elaborated on this by stating:

> "When I talk to these ladies they tell me that people frown upon them when they join the industry. Especially those who go and become operators underground, their friends would say, "You operate a roof bolter underground. Oh, no. Do you want to be like a man? Are you feeling like you having to compete with men?"

4.7.3   INTRAPERSONAL EXPERIENCES LEADING TO CAREER ASPIRATIONS

The participants were also of the opinion that the hardships they had faced in the mining industry had made them stronger as people. It has aided in building their confidence to the point that they feel comfortable mentoring and inspiring young girls interested in entering the industry whether they choose to stay or leave.

Although most of the women deliberately chose to enter the mining industry, two of them did not. Some participants entered mining coincidentally as they were both pursuing other avenues and happened to land in a mining company. They were both pursuing health science related functional jobs, and were not aiming at a particular industry. Even though they both landed in mining in the same manner, they experienced the industry in contrasting ways. Nokwanda reported the following during our interview:

> "And I was told that I was coming here for only a year or 1 ½ years just to be exposed and then I will probably go back, into another function, and so forth. And I am still here, 3 years later. It was a tough one. I had to learn a lot. I had to humble myself. I had to change myself in understanding that, "You know what, you may have been clever knowing everything in your previous job but this is a completely different job." I had to depend on the people. I had to depend on the people that report to me. I had to change my strategy of relating to people. I learnt a lot by my

mistakes. I really had to humble myself and eat a humble pie. And, yes, it has been the most wonderful experience of my life and I am not going anywhere. I will not go to any other position. The company has talked to me about other positions, back in the executive, which are not quite what is in line with Operations and I've declined them, with respect and appreciation, because I know they believe in me. They would not ask me for such but I think this is where I really want to grow, at this point in time."

In contrast to Nokwanda, Nomfundo brought to light the following during our interview:

"I've had this thing of wanting to work in international health. And I know what I should do and it is those things that I'm not doing that are not getting me there. I talk about looking through things and I'm going to apply and then I put it aside because I get caught up in the daily things. What it looks like and what it should be; I don't know but..."

For those who are highly accomplished and pioneered the entry of women in the industry, it was a matter of leaving behind a legacy for young girls. Matlatsi stated the following about her motivations for staying in the industry:

"Especially because I'm a woman, I want prove perceptions about women in mining wrong… to prove that I can do my work accurately, survey work has a lot to do with accuracy and there is a belief that a woman is incapable of being accurate. It takes time to prove a point being a black young woman."

4.8   LEADERSHIP

The leadership theme addresses how the women view leadership in relation to gender. Do they view themselves as leaders by virtue of roles they have played or as a matter of philosophy? How do they think they lead, or would lead, compared to their male counterparts? And do they think that South Africa is ready for profound and powerful women leaders. Three dominant sub-themes emerged in this regard. All the women were of the opinion that gender influences leadership ability and performance. Further, that one is born with the ability to lead. When probed about the South African state of readiness for a women leader, there answer was a resounding no.
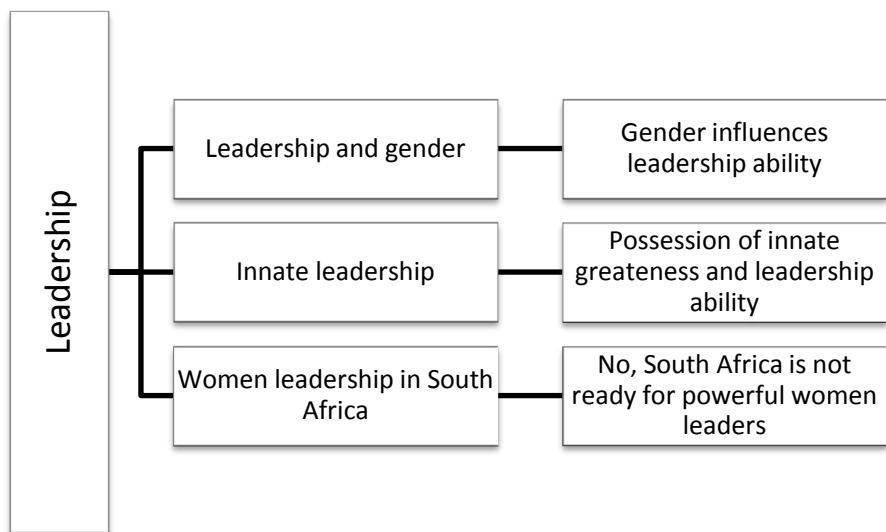
Figure 21: Leadership and gender

There was consensus among the participants that men and women have different leadership abilities and styles. In addition to making this assertion, most of the participants felt that women were naturally better leaders then men. Didi elaborated on this by stating:

"I would think so, because men and women have their own strengths and weaknesses. A very good example is just women being so strategic in what they do, being well organised. I think for, in as much as a man in leadership can have all the expertise that he needs, but you know organisational, like or strategically, just being able to do things in a certain way and do them properly. Lacking that can easily just affect everything, and I think women have that. They are more, I mean in addition to expertise, you might not have it at a higher level than a man, but the fact that all the strengths that a woman naturally has comes together with your expertise, makes women potentially better leaders than men."

In addition to agreeing that men and women have different leadership approaches, the participants also agreed that a leader is born and not made, that it is an innate quality within a person. Most of them felt that they were either born to be a leader or were born with 'greatness' and have the ability to excel in life. There were differences in articulation of greatness between the two cohorts when the question of one being 'great' was posed. The younger cohort all answered yes to the question of 'greatness'. Masindi gave the following answer when probed about being a great leader:

"Because there is this great leader in me. I'm a great leader, because of there is something in me that I didn't think was there, but then now, that seems to come out, and, which is great, so, I believe I'm a great leader."

This was the trend that emerged with all the younger women. The older women were all reluctant to label themselves as 'great'. They all deflected the question by answering 'no'. They felt that even though they were leaders and they had achieved a lot in their careers, labelling themselves as great would be a self-proclamation, thereby signalling that they were in fact not great. In addition, they felt that they had to remain humble despite their success and claiming to be great would not be showing humility. Jill stated the following when answering the posed question:

"Not great, but I think 'good'. I strive to be good, but it's about being humble at the same time."

Sue alluded to the same concept, although she did not phrase in the same way as Jill. She stated:

"No. I see myself more as a person that wants to give others greatness."

Largely, the younger cohort felt that they exemplified greatness already, whereas the older women felt that there was still room for growth. This was surprising as one would expect the inverse, that the younger cohort would feel the need for growth as they were just beginning their careers.

When the question of South Africa and the mining industry being ready for powerful and profound women leaders was posed, all the women were of the opinion that women are ready to play the role, but the rest of society is not ready and accepting of powerful women leaders. Didi asserted the following:

"The women are ready to play that role, but the men are not ready to accept it"

4.9 FAMILY LIFE

The family life theme investigates the personal lives and personal impact of career choices on the women. What kind of personal sacrifices have they had to make to get to the point they are currently in their lives and has it been worth it? The theme also tackles - more so with the younger women - whether or not they want to get married and have children and how that would fare with working in the industry.
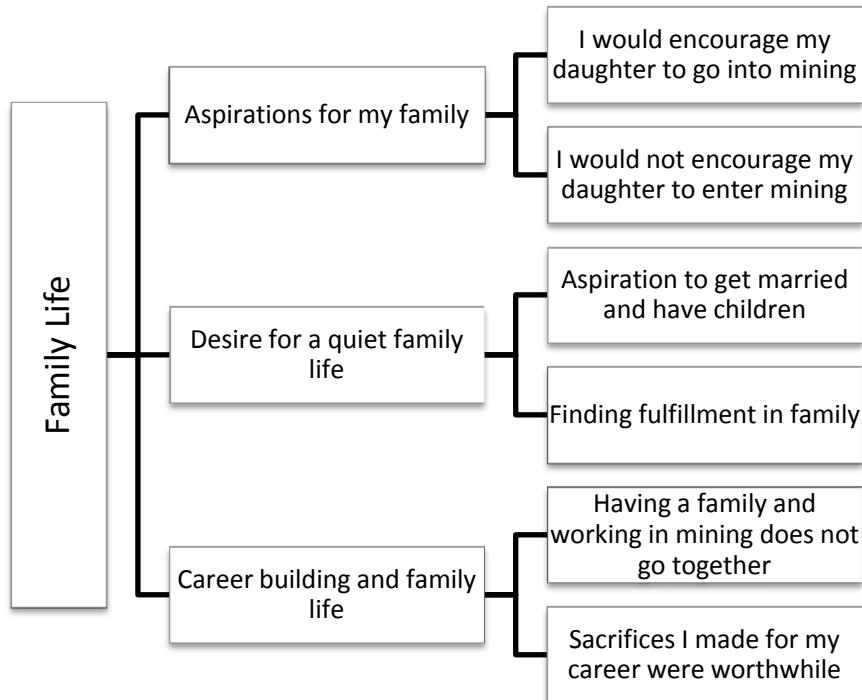
Figure 22: Balancing family life and working in the mining industry: the trade-offs

The theme of family life was a double sided theme in the sense that the two cohorts were coming from different angles. The younger women were all unmarried with no children, even though some mentioned being in a serious relationship. They all expressed a desire to get married in the near future and have children. Of the older women, two were married with children, although of the two, one was recently married and had four nieces and nephews that she had adopted after the passing of her sister.

Jill was unique in the sense that she did not have a significant other, she did not have children and her family lived in another country. She admitted that the main reason she

devoted herself to her work so much was partly because that is all she has at the moment. She stated this in our interview:

> "He died of a brain tumour a year ago… On my graduation day. So I've come back to South Africa with no family here, no friends, no partner and I work 12 hours/day to just try and keep going, so I'm finding my feet back here again… In an environment where I'm not acknowledged for… based on my gender and this colour which is…ja. I can appreciate where it comes from, but it's a hard environment to come back into, so it makes me sort of reconsider and think about you know, all the stuff you used to do, you know."

This links back to the question, have the sacrifices made for this career been worth it? This was a question for the older women, as the younger women felt that they did not have to sacrifice more than the usual time away from home to get to where they were. In contrast to the older women, the younger women spoke about hopes for a big family, some of the women also felt that working in the industry would impede this aspiration.

On the subject of whether or not, the women would encourage a live or imaginary daughter to pursue a career in the mining industry, the answers the women gave varied. There was a correlation between the women's desire to stay in the industry and the answer to this question. Lerato who stated her desire to leave the industry as soon as her bursary debt is worked back, answered the posed question by stating:

> "No, I'd be worried about her safety because it's a dangerous environment to work in."

In contrast to Lerato's answer, Sue who feels that she has been able to achieve her goals in the mining industry, while making a name had this to say when the question was posed to her:

> "I've got a step-daughter… I've already done so. She's started with CTC doing a mining qualification… because I evaluated her personality. She's a lot like me. She's a strong chick. She can handle it."

4.10 FUTURE ASPIRATIONS

The future aspirations theme looks at what the women desire looking into the future. Do they ever think about leaving the mining industry? What plans do they have for themselves and their families? This theme is how most of the interviews were rounded off together with family life to try and understand the women.
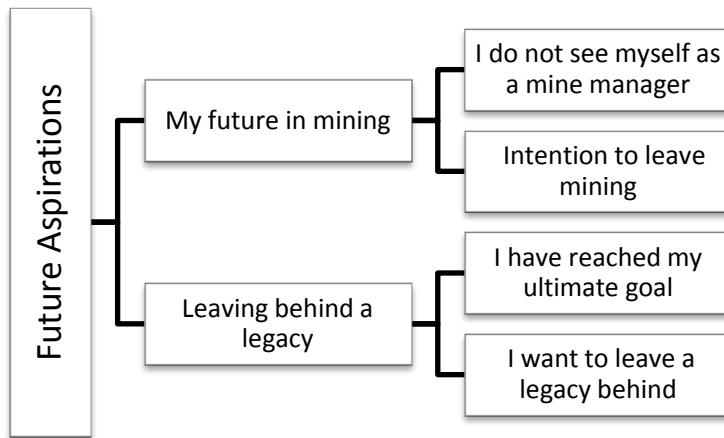
Figure 23: Future aspirations

As can be seen from the preceding Figure (23), it can be asserted that the women's future aspirations fall into two main categories; the first relates to the kind of future they see for themselves in the mining industry for the professional women in middle management positions. The second relates to leaving behind a legacy, in or out of mining for the older cohort already holding managerial positions. One of the younger participants, Masindi, said that her goal is to become a mine manager. She stated that this is what she is working towards.

"Right now, well, I know that I want to be a manger, a mine manager one day."

The only other participant who expressed a desire to climb the mining industry's ranks was Nokwanda who is already managing three mines. The only position she can move into if she were to get promoted is an executive level, and she did not explicitly mention her desire to move into that position. The rest of the younger women spoke about exiting the industry and either working in consulting or starting and operating their own businesses. Nomfundo spoke about exiting the industry to pursue an international health position, which is better aligned with her passion. For the other women aspiring to exit the mining

industry, challenges such as the glass ceiling, gender stereotyping and sexual harassment were noted, along with mining just not being particularly a passion for them.

The remaining older cohort of women spoke about leaving behind a resounding legacy, since they had achieved the goals they had set for themselves. Sue who is a CEO stated the following:

> *"My biggest goal is to be that somebody that has succeeded in making a value edition to people that is going to follow that path. I want to be like the Chris Barnard of this world. She started this company, it was a female company now there are 20 companies and they are all... That's the story that I would like to leave behind, my legacy."*

There was a strong sense of achievement and making a way for the new generation. Whether it is to leave the industry or continue building a future within the industry, all the women had a rather clear vision of where they would like to be in the future.

4.11   SUMMARY

This chapter presented the results obtained in the study using the life story interview. The information was presented chronologically starting with the early childhood experiences that led the women to make a non-traditional career choice. Following this was the journey through their schooling years and into a career in mining and future aspirations. The objectives of the study set out in the first chapter were used to guide the presentation of this data, that mainly good academic performance was the dominant factor in all the participants' lives, followed by an opportunity to study further at an institution of higher education, and for most funded by a mining company. The everyday experiences of the women were found to be very similar despite their different motivations for entering the industry and respective ages, causing those in the younger cohort to desire exiting the industry as a means of evading the persecution faced from their male colleagues and wider society. The next chapter will unpack the results and connect them to the information presented in chapter two, the literature review.

CHAPTER 5:DISCUSSION OF RESULTS

5.1   INTRODUCTION

The discussion of the themes is anchored in the concepts introduced in the literature review, wherein the tumultuous journey of women collectively into the mining industry was discussed. In addition to this, the current state of women in the industry was set by the descriptive information presented; in essence all these factors combined suggest that mining is a non-traditional career choice for a woman. Given this information, the broad objective of the study was to uncover and understand the life stories of women who choose to enter the mining industry, despite the negativity experienced. The objectives of this study were to:

- Understand the life stories of two groups of women in the mining industry in South Africa;
- Illuminate how early life experiences contributed to their current career path;
- Understand why women choose a career in mining;
- Identify the obstacles they faced in acquiring the positions that they hold currently;
- Identify strategies they used to overcome those obstacles and their aspirations for the future; and
- Understand the leadership pipeline of women in mining companies.

The diagram in Figure 24 below will be used to structure the discussion of the results. The highlighted sections are related to the analysis of the interviews and the presentation of the results. Whereas, the other two parts are connected back to the literature review in chapter two, they will only be discussed briefly as they have already been presented.

Influences to enter mining	Mining: Non-traditional career choice	Participants: Women in mining	Experiences and perceptions of a woman in mining

Early childhood influences *and* Basic education → **Childhood and adolescence**

Tertiary education *and* career choices → **Vocational decisions**

Career → **Career before mining**

Mining career: The journey so far, including triumph and disappointments

Perception of **leadership** as a result of being in the mining industry

The effects of mining on **family life** and attainable work-life balance

Future aspirations after or within the mining industry

Figure 24: The structure for Discussion of results chapter

5.2 MAIN INFLUENCES TO ENTER THE MINING INDUSTRY

The first section of the discussion delves into the main influences that motivated the women to enter the mining industry. As can be seen from the illustration in Figure 24, this section has broad categories, all of which preceded the women's entry into the mining industry. The last category will have limited application as out of the eight women; only three had a career before entering the mining industry.

5.2.1 EARLY CHILDHOOD AND ADOLESCENCE

5.2.1.1 *Early Childhood influences on career choices*

From the analysis of the information collected, the women interviewed came from widely varying socio-economic backgrounds, geographical locations and even generational cohorts. A fair amount of them came from townships, others from deep rural surroundings and some had a suburban upbringing. They grew up in areas widely dispersed across the country, with one being born in a different country altogether; Swaziland. The women's ages ranged from, the youngest being 24 to the oldest being 54, indicating different generational affiliations. They all reported growing up in a nuclear family structure, in a relatively stable environment.

None of the women recalled showing an interest in mining at an early age; most of them stated that they were not even aware of the industry or professions within the industry. Given this information, it can be asserted that familial home structure and socio-economic status have little to no influence on career decisions made later in life to specifically build a career in the mining industry. This finding draws a parallel with literature by Whitmarsh *et al.* (2007) which indicates that factors such as socio-economic status correlated with high career aspirations, but were not highly correlated to a particular career field.

This is also the time in the women's lives where they were socialised about gender role assignments - what is appropriate for a little girl and what is not. As discussed in the literature review, from an early age children are socialised to fit into their gender assignment. Little baby girls dress in pink, while little baby boys dress in blue (Eagly & Sczesny, 2009).

In the older cohort of women, the gender socialisation they received from their fathers in particular had a somewhat lasting impact, whether it was positive or negative. For the older women, the gender socialisation was mostly centred around what was appropriate for them as women, because they were considered the weaker sex and destined to get married and rely on a man for economic sustenance. In contrast, the younger cohort was greatly influenced by their mothers, who advocated for them to get an education and be self-sufficient. Their mothers felt that they had been disadvantaged by relying too heavily on their husbands, and thus did not want their daughters to bare the same brunt.

Given the gender socialisation they received as little girls, it can be purported that this led to them identifying strongly with their gender group. The women were forth right in asserting their gender identity and presenting it as a fundamental part of who they are. This makes the women more susceptible to stereotype threat. According to Schmader (2002) Steele & Aronson (1995) and Barieto, Ryan, & Schmitt (2009), stereotype threat is an uncomfortable situation where negative stereotypical beliefs about a social group undermine the performance of those in that social group, as well as the individual if reminded of these stereotypes. Schmader (2002) further claimed that stereotype threat is experienced to a greater degree by those women who strongly identify with their gender group as opposed to those who identify less strongly. Thus, although the gender socialisation they received at a young age may have had a limited impact in making the decision to join the mining industry, it does affect how the women experience the mining industry now. However, evidence could not be objectively established that gender socialisation led them to choose mining, as none of the participants connected gender socialisation and clear gender segregation to their decision to enter the male-dominated mining industry later in life.

The state of familial relationships and racial segregation was experienced in varying levels by the women, with no clear emerging trend. Thus is can be claimed that even though racial segregation and the state of familial relationships had an impact on the women's lives, it is unlikely it played a major role in them making the decision to join the mining industry. In summation, the stable environment and familial support in most of the cases

resulted in a high level of self-efficacy in the participants and set the stage for them to make a non-traditional career choice for women. As noted in the research by Whitmarsh *et al.* (2007), a high level of familial support is correlated with women who are more career-aspirational and thus more likely to choose non-traditional careers.

5.2.1.2   *Education*

Basic Education covers the women's schooling years from grade one to matric. The quality of education the women received varied from basic and quite poor, to middle class and well resourced. The level of gender and racial segregation also varied among the different participants.

The varying type of basic education among the women leads one to assert that the structure and class of education received by the women had a limited impact on their decision to join the mining industry later in life. A prominent feature of this theme is that all the women reported above average performance in school and in some cases excelled and were recognised as having been top achievers. The women also all displayed a specific interest for the scientific subjects.

The high level of performance the women displayed during their basic education years (and throughout tertiary education) laid a foundation for them to have a wider array of career choices to choose from. At the level of leadership they entered the mining industry, it was necessary for them to be high performers. Even though at this stage, many of the women had not entered or decided to enter the mining industry, the foundation had been laid for them to do so later on in life as they had the same options as their male counterparts.

5.2.2   VOCATIONAL DECISIONS

5.2.2.1   *Tertiary education*

Most of the women attended university immediately after matric. It is at this point in their lives that all the younger women decided to pursue a degree in engineering or science as they enjoyed maths and science and felt that those qualifications had a high level of job security. The older cohort of women did not have mining and to a large extent, engineering

as a viable option to study. At the time, mining was an illegal profession for women and engineering jobs were related to highly masculine industries like mining and construction. Familial influences, led to the women all choosing scientific fields of study, as they were reserved for high performers which all the women were. The younger cohort was at liberty to pursue any field of study; they all chose engineering.

5.2.2.2   *Career choices*

Most of the participants entered the mining industry through a sponsor or a bursar that paid their university fees with the clause that they are to work back the money paid as an employee of the mining company. As this was an economic decision for some, they feel that mining has limited options for them to reach their goals, and thus feel that they will exit the industry in the near future. The remaining women entered through serendipity which is similar to other studies on career entry of professional women (Bell & Nkomo, 2001).

5.2.3   CAREER

The accounts given by the participants were unique, but even so, several trends could be asserted. Nuclear family structure, with a stable upbringing was present among all the participants. Literature by Whitmarsh *et al.* (2007) and Domenico & Jones (2006) indicates that women who grow up with a supportive family structure are more likely to pursue careers considered untraditional for women; mainly those containing a high level of maths and science. Family support and stability has been shown in several research studies to correlate with a high level of self-efficacy (Nota, Ferrari, Solberg & Soresi, 2007; Torres, Solberg, 2001), and high self-efficacy was found in women who choose to pursue non-traditional career choices (Ferry, Fouad, & Smith, 2000; Özbilgin, Kusku & Erdogmus, 2004).

As noted earlier, high academic performance during basic and tertiary schooling was found among the women. This is important as mining, scientific and engineering qualifications are highly selective permitting only top students to enrol as they explore complicated concepts requiring an understanding in abstract subjects such as maths and science. Stereotypically, these are subjects that are not highly attributed to women. Early good performance from the participants in these subjects, together with a high sense

of self-efficacy created a conducive atmosphere for the women in this study to make a non-traditional career choice. All the participants also displayed interest in maths and science at a young age and knew even then they would pursue it vocationally, although the industry decision had not yet been anchored.

Most of the participants either applied or were targeted by mining companies because of their good academic performance or high career achievement at that stage in their lives. In these scenarios, entry into the mining industry can be considered through serendipity as the participants were pursuing functional aspirations. Even with these women, a choice in science and engineering prepared them for the role they would later play in the industry.

In summation, the following factors found in the study correlate with women who choose non-traditional careers:

- High family support and stability during the formative years of childhood;
- High academic performance from basic schooling to tertiary education, allowing the participants a wide variety of career choices;
- High level of self-efficacy from experiencing family support;
- Interest in maths and science related fields such as engineering, geology and biology related to work in the mining industry; and
- Application or recruitment by a mining company while pursuing a functional goal due to high performance.

5.3   WOMEN IN MINING: A NON-TRADITIONAL CAREER CHOICE

Based on the literature review done and the interview analysis, one can indeed purport that mining is a non-traditional choice for women. Mining as a profession requires heavy physical assertion in unfriendly working conditions for a small amount of remuneration. Families are torn apart as people have to relocate from their homes to the mines that are normally hidden away in remote and rural settings. These factors have earned mining an infamous reputation in South Africa, that not only is mining for men, but it is for strong men, and definitely not for women. Up until 1996, women were prohited from working underground in mines, and mining was not a viable career choice.

None of the women interviewed had a close family member, such as a father or a brother who worked as a miner, thus it can be assumed that they were shielded from the ugly side of mining while they were growing up. Even though the women knew that mining was a man's world, they assumed that they would not be working in the same line as the common miner. They would come in at professional positions and would enjoy a higher status then their male counterparts. They were not able to anticipate the tough enviroment they would face once they entered mining. The women reported that it was a surprise for them when they realised the level of open gender descrimination.

Even though society would consider the fact that mining is a male-dominated industry 'common knowledge', we have to consider who has been privileged to that knowledge. Most of the women did not grow up in a mining town or in a place where people were recruited for mining jobs. Most of them felt that they got into mining either through circumstances or through academic traction. They do not consider themselves as women who purposefully go against the norm, although they are all of the opinion that they have been able to make it as far as they have because of their innate strength at the face of adversity. In essence, the participants all possess a high level of self-efficay.

5.4   EXPERIENCES AND PERCEPTIONS OF WOMEN IN MINING

As different as the women's specific life journeys were, they share similar experiences in the mining industry. The themes that emerged in terms of the women's experiences are; mining career, leadership, family life and future aspirations.

5.4.1   MINING CAREER

The women were at two distinct points in their mining careers. The younger women were just starting their careers and were in professional positions that could be equated to being in middle management. The older women were all well accomplished. The two cohorts of women reported very similar experiences; as such their experiences will be presented as a whole.

5.4.1.1 _Challenges of being a woman in mining_

The first challenge the participants stated, which was present in both cohorts, was the feeling that their careers have been delayed or will be delayed because they are women; in essence that they have reached or will reach the glass ceiling as described by Barreto, Rayn & Schmidt, 2009 and Bell & Nkomo, 2001. They communicated being over looked for prominent positions that were given to less deserving male colleagues. The younger cohort reported that the threat of this has led them to not only consider, but come to the conclusion that they will be better served in another industry. The older women have contemplated other ways they could find fulfilment in their work besides promotion.

Career stagnation attributed to their gender has made the participants feel that they have to sacrifice their femininity to be taken more seriously by their male counterparts. This can also be seen as a way of divorcing the self from negative perceptions attributed to women in the mining world. Additionally, removing femininity made the women feel less targeted by sexual harassment, which most have reported experiencing.

The hardships of the mining industry have resulted in some of the women feeling confident and empowered by the fact that they are in a difficult industry and have still managed to climb the corporate ladder. Other women, mainly in the younger cohort, have been demoralised and internalised the notion that mining is not a suitable career for women. Many of them have decided to exit the industry as soon as they can without facing penalties associated with their bursary debt.

In summation, the participants reported these main challenges about being a woman in the mining industry, and these are:

- Career delay and stagnation. The feeling that their career progression was negatively affected by their gender. Most of the women in the older cohort felt that they had reached the proverbial glass ceiling;

- Disregard for the knowledge and skills offered by women despite the requisite qualifications and relevant experience;

- Sacrificing their femininity to mitigate the effects of negative gender stereotypes and stereotype threat on their behaviour. The feeling of divorcing the self from the wider gender group if success is to be an option; and

- Daily challenges of operating in an industry governed by patriarchal ideologies. These include experiencing chauvinistic and condescending attitudes and behaviour, blatant sexual harassment and unfounded superstitious believes.

5.4.1.2 *Wider societal perception of women in mining and its effects on intrapersonal experiences and motivations to continue in the mining industry*

The second portion of the women's experiences within the mining industry is connected to how wider society views women in mining. This in turn affects the way the women feel about the industry and their subsequent motivation to continue building a career in mining. Figure 25 illustrates this connection graphically.
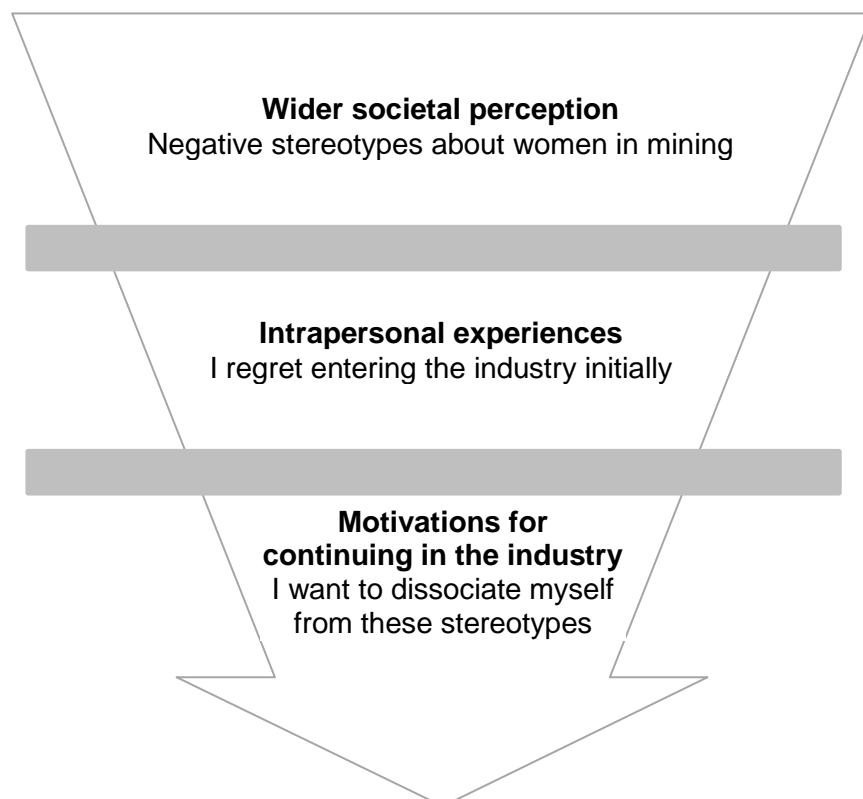

Figure 25: Wider societal perception and its effects on intrapersonal experiences and desire to stay in mining

The wider societal view that mining is a highly masculine industry and women who enter it are butch and likely to be homosexuals has not deterred the participants from choosing it as a career. This is likely to be because the women enjoy a high level of status as professionals and leaders despite it being in the mining industry. Stereotypes that bothered the participants more than those general ones were that mining is an unsuitable profession for a woman, and they are physically and mentally unable to cope with the demands. This affected both their passion for the industry and their desire to continue building a career in the industry. For some it lessened both aspects, while for others it made them feel more determined to climb the mining ladder and prove the stereotypes wrong. For the women who felt energised by the negative perception, a passion and love for industry developed. For those with adverse emotions, regret developed, accompanied by feeling trapped in the industry, mainly by the bursary debt.

5.4.2   LEADERSHIP IN THE MINING INDUSTRY

The women in the study were mostly of the opinion that leadership was a trait, a characteristic that one is born with or without it. Furthermore, they felt that leadership is connected to gender, and that one is a better or worse leader as a matter of gender. This finding is consistent with other research that shows women can sometimes internalise gender specific notions of leadership (Eagly & Carli, 2009). All of the women identified themselves as leaders, believing that they were born with the ability to lead people.

The older women had a sense of humility regarding the subject and took the opportunity to state that there was room for growth within themselves. The younger women felt that they were strong leaders and even 'great'. This can be attributed to a generational difference as the younger women are of the Y-generation which was brought up on rampant praise. In the South African context, they have also been the first generation after the renouncement of apartheid and taught to believe they have greatness within themselves and can achieve anything (Sullivan, Forret, Carraher & Mainiero, 2009). The participants all believed however, that women are ready to play the leadership role in the country and in the mining industry, but that wider society is not ready to accept that role yet.

Although the women attached leadership to gender, there was no explicit evidence that this was the result of working in the mining industry. None of the women mentioned the

industry in relation to this subject and their disposition on leadership was not established before they joined the mining industry. Their outlook could be the result of several different factors.

5.4.3   FAMILY LIFE AND FUTURE ASPIRATIONS
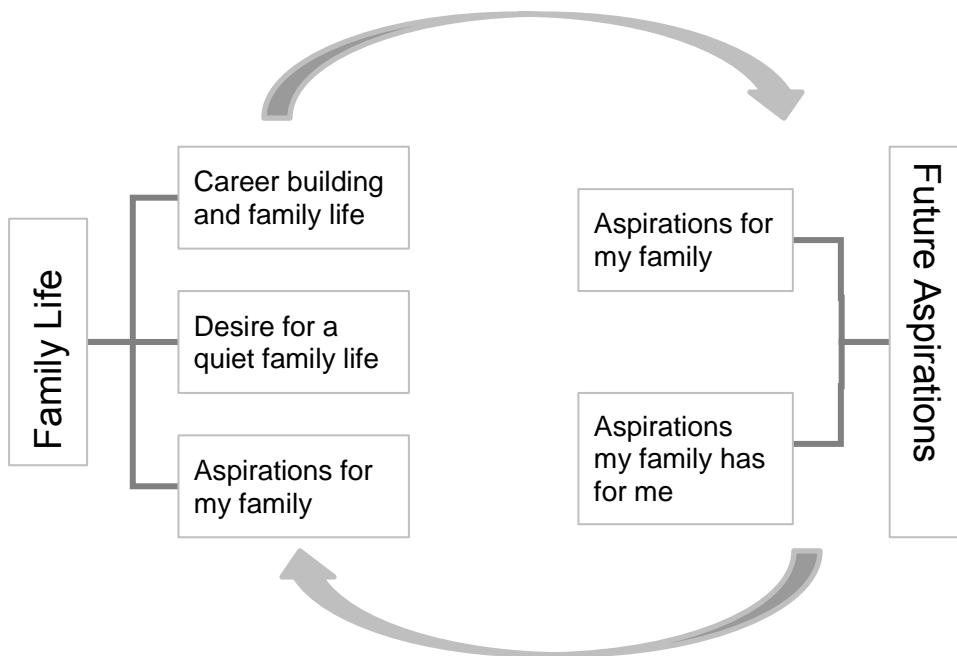
Figure 26: The interconnectedness of the family life and future aspirations themes

For most of the women, the need for a balanced and quiet family life was connected to their future aspirations, more so for the younger women who were not married and did not yet have children. This correlates with a study by Goulden, Mason and Frasch (2011) which indicates that family formation, most notably marriage and child rearing, is the reason why most women leave certain careers and in other instances the workplace altogether. For the younger cohort, beliefs about balancing a mining career and being a mother and wife were varied, with some believing it was possible and others not. There was a connection between exiting the mining industry and having a quiet family life. Previous research has shown that women more than men change their career plans based on their intention to have a family sometime in the future (Goulden, Mason, & Frasch, 2011). Women who had strong desires to stay in the industry felt that it would be possible to balance both aspects, whereas those who intended to exit the industry saw their desire

for family as another reason to leave the industry. The younger cohort was also concerned about climbing the corporate ladder. They spoke about being a manager and gaining a lot of material possessions. This was to be expected as they are at the dawn of their careers.

For the older women, family life was not an aspiration. The older cohort was also less concerned about getting promoted and moving to the next level. They mentioned something that was not a factor for the younger cohort; leaving behind a legacy. Most of them felt that they had accomplished the goals they set for themselves and thus wanted to be remembered for the contributions they made to the industry or their functional fields. Some of the women mentioned the sacrifices they made to excel in their careers, but none of them seemed to regret taking those decisions. None of the older women spoke about slowing down to enjoy the fruits of their labour, which ties back to the high level of ambition they displayed as younger women.

5.5   SUMMARY

Although the women were varied in their method of entry into the industry and the motivations or factors that have thus far kept them there, their experiences have been similar, even though their reactions to them have varied. They have faced challenges related to being respected for their work despite their gender, their careers being delayed, sacrificing their femininity and being exposed to overt sexual harassment. These challenges and experiences have been a source of growth for some, mainly in the older cohort, but have been a signal to exit the industry for others, mainly in the younger cohort. This explains to a certain extent why the technically qualified women-miner statistics have remained stagnant, because half the women are leaving the industry as fast as they are entering. This makes the leadership pipeline for women leaders in South African mining industry bleak.

CHAPTER 6: CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

6.1   CONCLUSION

The aim of this research study was to understand the life stories of women managers and professionals in the South African mining industry. This study was motivated by statistics showing that women continue to have miniscule representation in leadership and management positions in mining. Further, the research that has examined the status of women in mining has tended to focus on women miners - that is women doing underground mining. Rare are studies on women in leadership positions or the new cohort of younger women who have specifically pursued qualifications for professional and managerial positions in mining. The current study contributes to the limited body of knowledge available on the life stories and experiences of women in the South African mining industry holding managerial and professional positions. The study also makes a positive contribution towards understanding the challenges faced by these women and formulating strategies towards improving job satisfaction. Further, it provides mining companies with insight into the leadership pipeline.

The results of this study provide some initial insights into the life journeys of these women through life history interviews with eight women who fall into the aforementioned description. Overall, their life journeys revealed early life influences, the motivators for career choices and the on-going everyday challenges they face as women in non-traditional careers. The study revealed that for many participants, early childhood experiences in the areas of gender role socialisation and gender discrimination were not highly influential in steering them towards a degree in mining. It was rather good academic performance at a young age that allowed the participants the variety of career options that would normally be reserved for their male counterparts. When presented with these opportunities, the women in this study chose to pursue this rather unconventional career choice based on what they deemed interesting, accompanied by social support in their family environment. Other than receiving a study bursary from a mining company with mandatory work-back plan, there was no single reason given for entering mining consistent across the participants. In the end it was often serendipity that brought them to

a mining career. Both the younger and older cohort of women faced similar challenges in the mining industry. These included the experience of sexual harassment, gender stereotyping and the glass ceiling for those already holding managerial positions. These challenges led some women to agree with the contention that mining is no place for a woman, while it ignited others to prove their capabilities.

The leadership pipeline for women entering the mining industry can be considered bleak as half those entering the industry are eager to exit; this, found mainly in the younger cohort. The triumph over challenges facing women in mining does not form a good enough motivation for some of the participants to continue in the industry. For those who have already conquered the everyday challenges, heavy deadlines prevent them from pursuing widespread gender reform in the industry, although they do aim to make a difference in the lives of the few they come into contact with. Altogether, the findings of this study have major implications for practice.

6.2   LIMITATIONS

No research study is without limitations. Certain obstacles presented themselves during the course of the research. These were mitigated as far as possible, and where it was not possible to do so, the initial scope and delimitation of the study was slightly altered to accommodate the environment. These challenges were mainly around the quality of literature that could be obtained, and secondly, around the sampling process.

The quality of the literature available became a limitation of the study as limited to no literature could be found that dealt with a topic similar to the study. That is, literature relating to the life stories of women managers or leaders in the South African mining industry or similarly young professionals on research relating to any industry elsewhere in the world. Other literature topics and company reports were used to fill the gap where information was sparse, risking the validity and applicability of that information. Another challenge related to literature involved the recent nature of the literature obtained. Ideally, it would have been better to use literature written only within the last ten years, but as this was scarce, older research was used which may limit the accuracy of the data because of the passage of time.

The second major challenge was sampling. The target sample is naturally small and restricted to remote areas in mining towns. There is also no database available where the population is listed. Therefore, finding the target sample was difficult in both cohorts. The older women cohort was particularly difficult as the women were reluctant to participate. Only two out of the original four targeted agreed to participate, thus necessitating the delimitations of the sample to be loosened, to include women who were not directly involved in mining operations. For the younger cohort, finding participants with a specifically mining related qualification also proved to be difficult. Only two were found and interviewed for the study, again the delimitations of the sample were relaxed and two participants with an engineering qualification were interviewed for the study since they worked in the mining industry. Since it is the operational side that is the most difficult for women to function, obtaining managers in operations and young professionals with a mining related technical qualification would have produced richer insights, although it cannot be established to which degree. In summation, the study has added both to the research body of knowledge and practically in aiding mining companies to identify the factors leading to the high turnover among women in mining.

6.3   RECOMMENDATIONS

The recommendations section is divided into recommendations for mining companies and the mining industry in general, and academic recommendations for further research on the subject.

6.3.1   INDUSTRY RECOMMENDATIONS FOR MINING COMPANIES

The DMR is tightening the noose around the necks of mining companies demanding to see more women in technical positions. For a long time, mining companies have managed to pacify the DMR by channelling women into traditionally feminine roles in the HR, Administration and Finance departments, but this seems to fall short of the DMR's high expectations. The global talent crunch is also proving to be a problem. Mining companies are finding it ever so difficult to attract and retain talented women.

The study revealed that for the very few that enter the mining industry, retention is a challenge. Stating issues such as gender stereotyping, the glass ceiling and sexual harassment, younger professional women communicate aspirations to leave the mining world as soon as another opportunity presents itself. Mining companies need to rethink their retention strategies for managerial and professional women, one which will tackle the patriarchal and sometimes chauvinistic culture present in the industry.

The following are a few suggestions that could be implemented to attract more women to the industry and retain those who are already there.

- Target and nullify sexual harassment above and underground. Perpetrators should be prosecuted;
- Develop and implement a women mentorship programme for younger women with the right technical qualifications;
- Educate men about the business and moral reasons to have more women on the mine;
- Make provision for female friendly facilities, such as toilets and accommodation;
- Talk about the issue – the more people talk about it, the more awareness they have; and
- Make a concentrated effort to attract more women into the industry.

In addition to retention, the study revealed that majority of women came to a career in mining through serendipity. To increase the number of women entering at the professional level and also studying relevant degrees, industry programmes ought to be introduced that focus on educating women about possible careers in mining. This type of outreach should occur in secondary school and in tertiary institutions. Companies should accelerate bursary schemes for women and do more to attract them to a mining career at the professional, managerial and executive levels.

6.3.2   RECOMMENDATIONS FOR FURTHER RESEARCH

The small number of participants in this study limited the degree to which the results could be generalised to other women in the industry. Although the aim of this study was not to generalise but to understand, a larger study with more participants would increase understanding and allow for validation of the preliminary findings among the present sample of women. Future studies should target a larger sample of women if possible. Research into the specific segments of the industry would also be desirable, as women in the platinum segment of the industry may face different challenges to those on the coal side. There is also a need to do comparative studies of both young, professionally qualified men and women. This type of study would help to calibrate whether there are gender differences in the perceptions of mining as a desirable career.

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APPENDIX A

- Informed consent form -

Faculty of Economic and
Management Sciences

Informed consent for participation in an academic research study

Dept. of Human Resource Management

LIFE STORIES OF MANAGERIAL AND PROFESSIONAL WOMEN IN THE SOUTH AFRICAN MINING INDUSTRY

<u>Research conducted by</u>:

Miss L. H. Letlape (04427785)
Cell: 073 653 8789

Dear Participant

You are invited to participate in an academic research study conducted by Lesego Letlape a Masters student from the Department Human Resource Management at the University of Pretoria.

The purpose of the study is to the purpose of the study is to explore life stories of women who occupy high influential positions in the mining industry and women who are technically educated with a mining related degree using the life story methodology in both instances.

Please note the following:

This study is <u>anonymous</u>. Your name will not appear on the interview and the answers you give will be treated as strictly <u>confidential</u>. You cannot be identified in person based on the answers you give.

Your participation in this study is very important to us. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences.

The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.

Please contact my supervisor, Prof S Nkomo, 082 416 6308/stella.nkomo@up.ac.za if you have any questions or comments regarding the study.

Please sign the form to indicate that:

You have read and understand the information provided above.

You give your consent to participate in the study on a voluntary basis.

_____   _____

Respondent's signature   **Date**

Appendix B

-Invitation for participation form-

Faculty of Economic and
Management Sciences

Invitation for participation in an academic research study

Dept. of Human Resource Management

LIFE STORIES OF MANAGERIAL AND PROFESSIONAL WOMEN IN THE SOUTH AFRICAN MINING INDUSTRY

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You are invited to participate in an academic research study conducted by Lesego Letlape a Masters student from the Department Human Resource Management at the University of Pretoria.

The purpose of the study is to explore life stories of women who occupy high influential positions in the mining industry and women who are technically qualified with a mining related degree using the life story methodology in both instances. The method of data collection using the methodology will be the life story interview; this is an in-depth interview that focuses on the life of the respondent. The information gathered within the interviews is intended to answer the following questions:

- To understand the life stories of women in the mining industry in South Africa.
- To understand why they chose a career in mining.
- How did their early life experiences contribute to their current career path, and what obstacles did they face in acquiring the positions that they hold currently.
- What strategies did they use to overcome those obstacles.

The study will be conducted as follows:
The study will involve an anonymous interview and your name will not appear on the interview transcript and the answers you give will be treated as strictly confidential and will not be used by any party to try and identify you.
The results of the study will be used for academic purposes only and may be published in an academic journal.
I will provide you with a summary of our findings upon request.
The interview should not take more than an hour and a half of your time and will be done at your convenience.
Your participation is very important to me. You may, however; choose not to participate and you may also stop participating at any time without any negative consequences.

If you have any concerns, questions or comments please feel free to contact me or my supervisor, Professor Stella Nkomo: stella.nkomo@up.ac.za

I hope you will choose to participate in my study and look forward to hearing from you

Yours sincerely
Lesego Hellen Letlape

APPENDIX C

- Interview protocol-

The following questions will be considered as a means on initiating dialogue, adapted from (Bell & Nkomo, 2001):

Sample interview questions	
Topic	**Sample questions**
Part I: Early childhood experiences	
Early life experiences and influence	Where did you grow up?
	Tell me about your Mother and the relationship you have (had). Did she work while you were growing up?
	What kind of person is she?
	What advice did your mother give you when you were growing up?
	Now tell me about your father and the relationship you had with him.
	What kind or relationship did your parents have with each other
	Tell me about your siblings and the relationship you had with them?
	What kind of community did you grow up in?
	Who was influential in your early life?
	As a child when did you first become aware of gender and racial stereotypes and differences?
	Did your parents talk about gender and racial issues at home?
	Is there any memory that stands out when you think about your childhood, good or bad?
Education	*Basic education*
	What kind of schools did you attend?
	Was there a racial composition?
	Was there a gender composition
	How were you treated?
	How was high school?
	Was race and gender a large part of your

- 123 -

	schooling dynamic?
	What historical events stand out for you when you think about your scholar years?
	Do you remember a specific teacher that had an impact on your life?
	Tertiary education
	What influenced the career choice you made in tertiary?
	Where did you attend varsity?
	What made you decide to attend that specific varsity?
	Where did you live during your varsity years?
	Who were your friends they?
	What memory stands out the most when you think about your varsity years?

Part II: Early Adulthood experiences	
Career choices Career choices Career mentors	When did you decide your career goals?
	What aspirations did/do you have for your career; personally and socially?
	What other factors contributed to your career selection?
	Can you tell me about your current job? What does it involve?
	What does a typical work week entail for you?
	At what level in the organisation are you currently? What are the current career prospects?
	What was the first significant leap (quantum leap) you made in your career? Critical turning points?
	What is your biggest challenge working in your current position?
	What kind of personal sacrifices have you had to make to get to your current position?

	Has your current organisation aided you in achieving your career goals?
	Have you changed significantly as a person over the course of your career?
	How would you assess your career at this point?
	What are your dreams for the future?
	Please tell me about your first job, age and what were/ are the demographics of the company?
	Did you find that you were treated differently as a woman?
Mining as a career	Do you think there is a stereotype about women in mining?
	How would you describe mining?
	What type of personality traits do you need to have to be successful in the mining industry as a woman?
	Have experienced discrimination in any way? Tell me a bit more about that?
General questions	Do you think the career is different for men when compared women?
	Do you think it is easier or harder for you to work in the mining industry as a woman?
	To you think Affirmative action is a factor to your success?
	Do you think there is a difference in the way men and women lead?
	Do you think of yourself as "great"?
	Do you think South Africa is ready for profound and powerful women leaders in the mining industry?
	Would/do you encourage your daughter to take the same path you have?

Future and way forward	Would you ever leave the mining industry?
	Where do you see yourself in the next ten years?
Work and family	What challenges do you/have you experienced balancing work and personal/family life?
	Do you have children? Tell me about them? Do you plan of having children
	What are your hopes for your family and the role you will play in that?[1]

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[1] The questions listed in the interview protocol will be used as a probing mechanism and to ensure that the researcher covers all the relevant information. They will not be followed question for question as the nature of the interview is semi-structured and informal.

APPENDIX D

- Code list and definitions-

Early childhood influences	
Clear gender segregation from a young age	Parents spoke about and clearly communicated different gender roles to the participant
Clear racial segregation from a young age	Community had clear racial lines, with races segregated according the racial groups
Close relationship between parents	Denotes the experience of stability in the participant's life from an early age.
Close relationship with father	Participant has or had a close and open relationship with her father, and considers them a significant contributor to their success in life.
Close relationship with mother	Participant has or had a close and open relationship with her mother, and considers them a significant contributor to their success in life.
Close relationship with siblings	Participant has or had a close and open relationship with her siblings, and considers them a significant contributor to their success in life.
Distant relationship between parents	Parents of the participant had a tumultuous relationship with a lot of ups and downs
Distant relationship with father	Participant had a distant relationship with her father and felt that she cannot communicate with him.
Distant relationship with mother	Participant had or still has a distant relationship with her mother, resulting in limited communication and interaction
Distant relationship with siblings	Participant had or still has a distant relationship with her siblings, resulting in limited communication and interaction
Experience of financial hardships	Participant grew up in a lower middle class home, where she was able to get the basics, but still had to go without cloths and extras sometimes.
Father did not teach me much about being a woman	Father did not play a significant role in how I defined my identity as a woman.
Father taught me a lot about being a woman	Father had a significant role in the woman I become and had a lot to add to my definition of what is a

	woman supposed to be like.
Father was a great example of a leader	Participant's father was a great role model and in some way the participant aspires to be like her father.
Grew up in a middle class/privileged community	Participant grew up in a middle class/privileged community with basic amnesties served
Grew up in an underprivileged or underserved community	Grew up in a township or rural area, with poor utilities, such as education and basic services like water and sanitation. This also indicates the resilience of a participant as they had to overcome more than the average to get things others view to be basic
Mother did not teach me much about being a woman	Mother did not play a significant role in how I defined my identity as a woman.
Mother taught me a lot about being a woman	Mother had a significant role in the woman I become and had a lot to add to my definition of what is a woman supposed to be like.
Mother was/is a great example of being a strong woman	Participant's mother was a great role model and in some way the participant aspires to be like her mother.
Nuclear family structure	The participant grew up in a family that has or had a father, mother and siblings, thus denoting the traditional nuclear family.
Sign of intelligence from a young age	Participant was labelled as being smart or intelligent from a young age and throughout schooling years through above average and sometimes distinctive academic performance.
Stable environment	Denoting that the participant experienced a stable upbringing, lacking in unusual patterns of fighting, rampant partying or big familial problems.
Stand out memory	A particular memory from the participant's memory that stands out for her.
Underprivileged environment developing into a metropolitan	The previously underprevilaged environment that the participant grew up in has developed into a buzzling metropolitan area
Unstable early environment	Participant experienced instability in their lives at an

	early age.

Basic Education

Clear gender segregation	During the participants schooling years there was a clear segregation in the roles that were played by the different genders, thus affecting the participant's perception of what would be an appropriate vocational choice for them.
Clear racial segregation	A clear racial division in the lifestyles and the roles that were played by the different races during the early years of the participant and within the context of the then ruling principle of Apartheid.
Good basic education	Denotes that the participant went to a school that had a strong syllabus, good teachers and produced high pass rates.
High academic achiever	Participant recognised and performing at a higher level than expected for that grade, also getting recognised with certificates and medals as performing at a higher level than the classmates.
Poor basic education	Participant went to an underprivileged, or underserved school where the level of education was poor in comparison to the criteria and other schools in the area
Stand out teacher	A teacher that stands out in the participant's mind when they think about their basic education
Unclear gender segregation	Genders are mixed with minimal role-gender definition
Unclear racial segregation	Mixed racial interaction, with minimal race-role definitions

Tertiary Education

Active social life with minimal study	Participant was big on partying and having an active social life, while still managing to pass. Studying was not the participant's central focus.
Attended mediocre university	The participant attended an ordinary university that is not rated among the top universities in the country.

Attended top university	The participant attended a high achieving university that is rated among the top universities in the country.
Choice of university influenced by field of study	The participant's choice of university was influenced by the field of study they have chosen, as that school is known to excel in that field, or the school is the only one that offers that course of study.
Choice of university influenced by parent	Choice of university chosen by the parent of the participant either through advice or coercive actions
Choice of university influenced by political atmosphere at the time	Choice of university was influenced by the politics of the day that restricted where black people could study
Choice of university influenced by self	The participant has chosen their own university based of other factors, such as proximity to home, lack of options or social life.
Close social relationships with friends	Participant formed close social relationships with friends and had good social support
Heavy studying with minimal social activities	Participant was heavily focused on studying and hardly undertook in any social or partying activities.
High academic achiever	Participant performed well in varsity, sometimes acquiring degrees with distinction
Influenced by other factors not related to familial influence	Factors that did not involve familial pressure factored in career choice in tertiary. These may include associated status of field, potential salary earned, or career exposure

Career choices	
Clear and focused career goals	Participant has clearly defined what career goals they seek to achieve and how they will achieve those goals.
Entry into mining motivated by early exposure	Participant entered mining due to early exposure to the mining industry, either through parents or thought the community she grew up in.
Entry into mining motivated by the need for a new avenue	Participant entered the mining industry looking for a new avenue, and not necessarily because of their passion for mining

Entry into mining through a bursary or scholarship	Received a study bursary from a mining company with a clause to work back the money paid towards the Participant's studies as an employee.
Entry into mining was coincidental	Entry into mining was a function of changing jobs and not a deliberate action on the part of the participant to be involved in mining.
Motivated by personal interests	Participant chose field of study based on their personal interests and hobbies
Motivated by possible future income	Participant made career choice based on the possibility or knowledge of high future income when compared to other career choices.
Move from other fields to mining motivated by respect of mining	Move to the mining industry motivated by respect for the mining industry
Persuaded by family members	Family members played a significant role in the career choice made by the participant, either by stating overtly, or being coercive.
Through research and career guidance	Participant chose career field based on research or career guidance.
Unclear career goals	Participant has unclear or unspecified career goals where she is looking to advance and move to the next level, but has not yet specified what that may be.

Career	
Balanced work stream with adequate personal time	The participant's work load and hours are well spaced during the day and she feels that she has enough time to spend with family and do extra mural activities. Work life balance can be considered good.
Busy work streams with little personal time	Participant feels over loaded with work demands and feels that they sacrifice time at home and with the family to meet work demands. Work life balance can be considered poor.
Career progression through affirmative action	Participant feels that a main contributing factor to their current career success has been legislated affirmative

	action.
Career progression through my organisation	Career progressed through the aid and the role of the participant's organisation.
Career progression through personal accomplishment	Participant feels that their current career success is through their own personal accomplishments and hard work and not through legislated affirmative action or tokenism.
Challenges experienced by both genders in the workplace	The participant feels that the challenges they face or have faced are faced by both genders and are not a result of their gender.
High current career achievement	The participant is at a high level in the organisation and a measurable amount of accolades and awards.
High level in organisation	The participant is in a high level in the organisation in terms of spaces between the participants level and the CEO of the organisation. This is denoted as either executive or higher senior management.
Middle level in organisation	Denotes participant is in middle management or at a professional level of the organisation.
Quantum leap point	The event or point in the participant's life that led them to the current position in their life
Women are more effective than men	The participant holds the view that women are better at doing the job than males

Mining Career	
Being a women bringing about a doubt in others' minds of my abilities	My gender and age brought about a doubt in the minds of those around me regarding my abilities.
Biggest challenge experienced	The biggest challenge experienced by the participant in their current job
Career delayed because I am a woman	Being a woman delayed my career as I wasn't given enough respect or training because of that
Career experience aided in building my confidence	The hardships I experienced in my mining career have aided to build my confidence and make me a stronger

	woman
Challenges purely because I am a woman	The participant feels that the challenges they have faced or are facing are a main result of them being a woman as oppose to a man.
Experience of sexual harassment	Experience sexual harassment in the mining industry, differing in degree from light and "funny" to vulgar and intrusive
Highly accomplished in mining field	Participant is considered highly accomplished in her field
I haven't changed since I joined mining	There participant is of the opinion that they haven't really changed a lot since they joined the mining industry, mainly because they were already matured at that time, in combination with the fact that mining is not a passion of hers
I love mining now	Participant feels that even though they did not initially strive for mining, now that they are in a front line position in the mining industry, they love it and do not want to do anything else
I want to prove the women stereotypes wrong	Desire to prove the widely held stereotypes that mining is not well suited for women wrong through high performance
Limited exposure to sexual harassment	Participant experienced limited exposure to sexual harassment mainly due to them entering at a senior level
Limited stereotypes about women in mining	The participant is of the view that the there are no prominent stereotypes of the type of women that chooses to go into the mining industry.
Not suited for women	The participant is of the view that women are not well suited for work in the mining industry.
A personal trait for success is strength	Participant is of the view that there are specific career traits that a women needs to have in order to function and excel in the mining industry, and one of those is a strong personality or character.

Pioneering woman in the workplace	One of the first or the first women to enter the environment at the time
Regret entering the mining industry	Regret if entering the mining industry through bursary agreement or selecting a mining-related field of study
Sacrificing femininity	Participant feels that she had to forego her femininity working in the mining industry to be taken seriously and viewed as an equal to men
Strong stereotypes about women in mining	The participant is of the view that there are prominent and strong stereotypes of the type of women that chooses to go into the mining industry.
Women are progressing in mining	Women are progressing in mining and there is a bright future ahead for the younger women that decide to enter the mining industry

Leadership	
I am a better leader because I am a woman	The participant sees a difference in the leadership styles between men and women and sees the style employed by men as weaker, thus viewing themselves to be a better leader on the basis of a feminine leadership style.
I am a great	Participant views herself as being "great"
I am a leader	Participant identifies themselves as being a leader and playing a leadership role
I am learning how to be "great"	Participant thinks they have greatness in them that they are learning how to exude in a socially acceptable manner
I am learning how to be a leader	The participant does not see themself as an accomplished leader, but rather in the process of becoming one and thus in need of more education and enlightenment.
I am not "great"	Participant does not see themselves as "great"
I think men are better leaders then women	Participant is of the opinion that men are better leaders then women

I was born to be a leader	The participant views themselves as possessing the natural characteristics that they view to be necessary to be a leader, thus viewing themself as a born leader.
I was not born to be a leader	The participant does not view themself as possessing the natural characteristics that they view to be necessary to be a leader. Thus believing that they can learn to be a leader and were not born as such.
Men and women are different leaders	Men and women have different leadership styles, but not to say that one is better than the other, they are just different.
No South Africa is not ready for powerful women leaders	The participant is of the view that the South African society is not ready to accept and promote exceptional women leaders.
Yes South Africa is ready for powerful women leaders	The participant is of the view that the South African society is ready to accept and promote exceptional women leaders.

Family Life	
Aspiration to get married and have children	I would like to get married and have children of my own one day
Finding fulfilment in family	Participant experiences the need to find fulfilment in other aspects of their life besides high income
Having a family and working in mining does not go together	In order for me to have a family, I would have to leave the mining industry
I would encourage my daughter to go into mining	Participant would encourage her daughter or a younger close family member to go into mining if they expressed an interest in the field
I would not encourage my daughter to enter mining	I would not encourage my daughter to enter mining because of the tough experience I have had myself
No desire to get married or have children	The participant does not desire getting married or having children, or more children
Sacrifices I made for my career were worthwhile	The sacrifices the participant made to excel in her career are viewed as worthwhile and as a necessary

	phase in life.
Scarifies made for my career	Time spent with the family falls under one of the things the participant has sacrificed to excel in their careers.

Future aspirations	
Desire to become a Mine Manager	Participant expressed a desire to be a Mine Manager
I do not see myself as a mine manager	Being a mine manager is not my dream; I am not interested in that at the moment
I have reached my ultimate goal	Participant is of the view that they have reached their ultimate goal and have no career aspirations to fulfil.
I want to leave a legacy behind	The desire to leave a legacy that is profound and recognised by other people
I will never leave mining	The participant sees a future for themselves in the mining industry and does not foresee themself ever exiting the industry to pursue their chosen career field in another industry.
I would leave mining	The participant does not see a future for themselves in the mining industry and foresees themself exiting the industry to pursue their chosen career field in another industry.

APPENDIX E

- Participant profiles-

Position: Participant 1

Alias: Lerato Masemula

Age: Mid 20s

Occupation: Electrical engineer in training

Lerato is a young black woman who grew up in a township north of Pretoria called Soshanguve. Her father was a truck driver and her mum a street hawker. She is the last of five siblings, but according to her, never got to play the baby of the family. Lerato's parents worked modest jobs, but were still able to provide food and clothing for all her siblings and even fund university education. The virtue of diligence has always been of importance to the family and something her parents sort to pass down to her.

As a student in a poorly funded township school, the quality of education given left much to be desired. There teachers were lazy and frequently told the students that they were destined for a life of missed opportunities and dreams never accomplished. At that young age, Lerato taught herself that life becomes what you make of it. She worked hard and taught herself throughout primary and high school, while still maintaining a rather active social life. Her diligence was rewarded as she passed matric with flying colours. She obtained numerous distinctions and was approached by an array of companies with bursary offers.

She chose to enrol at a university close to home because she felt that her family still needed her support as did she need theirs. She chose to pursue engineering because she heard that it was for intelligent people, and she certainly was one of them. She also enjoyed and was fascinated by the workings of electricity and thus chose to enrol for electrical engineering at the University of Pretoria.

Her under graduate years were challenging, the workload and complexity of the degree was overwhelming, but Lerato fell back on the principles of hard work that her parents taught her and was duly rewarded. She completed her degree with a great percentage and within record time and was recruited to join a coal mining company. She is currently stationed at one of the company's top mines and is busy with a master's degree in energy efficiency.

Position: Participant 2

Alias: Matlatsi Manono

Age: Mid 20s

Occupation: Mine surveyor in training

Matlatsi is a young black woman born in the rural town of Jean Furse in Limpopo where she lived with her three siblings and parents. Her father worked a modest job away from home, what that was exactly, she never knew, while her mother was a stay at home mum. Matlatsi's father was very strict, especially on her and her sisters and channelled them towards getting an education. Both her parents were not well educated, but knew the value of education non-the-less. Her parents were also very religious, believing that God belonged in all decisions one chooses to make.

As the youngest, she was the apple of the father's eye. He put all his hopes into her and always encouraged her to go further and try harder. With a stay at home mum, Matlatsi's only responsibility was to perform well in her academics. She remembers working hard and applying herself, she was known throughout her town as the 'smart' kid and went on to represent her province in the science and maths Olympiads. From a young age, the world was her oyster.

Being from a rural town, information was scarce and as intelligent as Matlatsi was, she didn't know of the opportunities that were available to her besides the usual law and medicine. She decided to pursue medicine, also by in large because her father pushed for her to do so. By the time she applied, she was told that the course was full and that she would be let in to study pharmaceutical. Both she and her parents decided that was not good enough and at the last minute scrambled to find another university to administer her.

Fortunately she found one, but was then forced to enrol for a national diploma and not a degree. She took it at stride and worked hard non-the-less. She was rewarded with a distinction her diploma and Btech, and a bursary and job at a top coal mining company. Currently Matlatsi is working in the field as a mine surveyor and is looking forward to pursuing her studies further.

Position: Participant 3

Alias: Sue Pinache

Age: Early 40s

Occupation: CEO of a mining company

Sue is a white middle-aged woman living in Pretoria where she also runs her own mining company. Sue grew up living the way a child born to a mining family would live, moving from small town to small town. Although this brought a certain level of instability to her life, Sue could always rely on her family. She was very close to her siblings and her parents and they provided the stability that she needed. Both her parents were strong willed people and installed in her a high level of self-efficacy.

Due to her love of science and the technical world, Sue decided to attend a technical school where she was only one of four girls in the whole school. She took this as a personal challenge for her social group, to prove that women are as capable as men. This determination resulted in her performing well in her matric, but unlike what everybody else was doing at the time, she decided to pursue employment before a degree, and started working for a utilities company in the lab. She performed well and at the tender age of 28 found herself confronted with one of the biggest challenges of her life, leading a group of 60 crass middle aged men. These were the kind of challenges Sue lived for.

Her performance caught the attention of a big international mining company trying to obtain a foot hold in South Africa. They asked her to complete a formal qualification and shipped her off to Zambia for operational mining training. This groomed Sue into the strong woman she is today, the challenges brought about great, but tough lessons. She then decided that it was time for her to venture out. She returned to South Africa and started her own open cast mining company with the backing of her former employer. She recalled the challenges of being a female owned mining company and reiterated that the main reason the company was moving slowly was because of her gender. Sue sees herself as a pioneer for young women in this country and vows to continue running her company until a break though is reached for women in mining.

Position: Participant 4
Alias: Diditle Ledwaba
Age: Mid 20s
Occupation: Industrial Engineer in training

Diditle, known to most as Didi, is a young black woman from Polokwane in Limpopo, where she spent most of her childhood. She is the youngest and only girl among four siblings and unfortunately lost her father at a young age. Her mother is a teacher at the local school. Didi and her family have a distant relationship, especially with her mother. She is not sure why this is the case, but feels that her mother has had difficulty connecting to people since her father passed. Despite this, she knows that her mother has always wanted the best for and strived to do so by sending her to good schools.

Didi has always been a hard worker, this is something she held very dear to her heart, she wanted to make her late father proud and sort to do so through her academics. Her good performance afforded her the opportunity to attend among the best schools in her community, one of which was a former technical boys' school. She continued applying herself and outperformed the boys at the school. This was of significance as the gender tensions ran high.

The technical exposure Didi received during her schooling years entrenched the love of science and the technical subjects within her. She always performed well and decided that engineering was for her. After doing a bit of research she came upon industrial engineering, which focused on optimisation of processes. She decided to enrol for it at the University of Pretoria and was fortunate enough to receive a bursary from a mining company to fund her studies. She continued to apply herself and made great friends in the process. She managed to finish her degree in record time at a good percentage. She is currently working for her bursar company at their flag ship mine, performing well and getting recognition for her work.

Position: Participant 5

Nick name: Masindi Raluare

Age: 26

Occupation: Mining Engineer

Masindi is a Venda woman who grew up in a township close to Thohoyandou. She grew up in a middle class family where both her parents were teachers at a nearby school and has three other siblings. She has a particularly close relationship to her mother and sister and feels that they instilled a sense of womanhood in her that has carried her through her education and personal relationships.

Like everyone else at home, Masindi dreamed of being a medical doctor, but changed her mind in matric when a university representative came to give her and her classmates career guidance. She received a book with all sorts of careers listed and patiently went through it. She fell upon Engineering and liked the sound of it. She had a chat with her friends and everyone was as fascinated with engineering as she was, but they all spoke of mechanical and Electrical, however Masindi wanted to be different. She wanted something nobody else was doing and that's when she fell upon mining engineering. She consulted her mother about her idea and she pointed to a distant cousin who had studied the same field and was now in the industry. What fascinated Masindi and her mother more, was the seemingly high income he was getting. She gave him a call and he recommended the field to her.

Sue enrolled at the University of Pretoria to pursue a Mining Engineering qualification which she obtained in 2009 after five years of study which were all sponsored by a bursar. She got recruited by a Coal mining company as an engineer in training and accepted the offer of employment. After the mandatory three year training period, she got appointed as a Mining Engineer.

Some of her career accolades include passing her Mine Managers' Certificate, winning the graduate in training symposium and going abroad and inventing a lifesaving gadget for those working underground in the mines.

Position: Participant 6

Nickname: Jill Smith

Age: Early 40s

Occupation: Senior Mining Innovation manager

Jill is a middle-aged English woman who grew up in Port Elizabeth. She is currently single after having lost her boyfriend to a brain tumour and has family living in Australia. Jill grew up in a middle-class family where her father was a university professor and her mother a house wife. She has one brother and they didn't grow up particularly close. She attended a nearby girls-only school and her brother a boys-only. She remembers always being active and loving the outdoors.

Because of her interest in nature and hiking, she wanted to pursue a career in nature conservation, but those plans got deterred when her father said she must go study a general BSc as free education was a benefit he had as a university professor.

She thus enrolled in the University of Port Elizabeth to study a general BSc with Maths, Physics and Geology. Due to her high performance she later got recruited by a mining company who gave her a bursary and moved her to Rhodes University.

She started working on the mines as a student for vacation work. At the time, the had never been a woman on the mine before, the men were startled to say the least and some of them blatantly refused to work with a woman on the mine because of superstitious reasons. Despite all of that, Jill worked her way up and even got a seat as an advisor to the minister of Resource and Minerals at the time.

She was sent by her organisation to do a PhD at the Colorado School of Mines and is now a senior manager at the mining innovation hub, where she advises and supports a lot of mines in South Africa.

Position: Participant 7

Alias: Nokwanda Jele

Age: Late 40s

Occupation: General Manager Captive region in charge of three mines

Nokwanda is a Xhosa woman from the heart of the Eastern Cape. She grew up in an upper-middle class family where her mother was a house wife and her father was a cabinet minister in the old home land government.

Nokwanda grew up in a big family of seven children, but was especially close to her younger brother as they were only nine months apart. She was also close to her father, but recalled that they used to butt heads as their personalities were very similar.

Nokwanda studied biology at a traditionally black university under the umbrella of education, as women had limited options in those days. She went on to do an honours degree in Botany. After teaching high school for a year, she received a scholarship to further her studies in the USA. She did a masters and a PhD before coming back to South Africa.

She went on to be a lecturer, and then joined the government in a senior position where she stayed for a few years. She tired of the politics and joined a mining company as an Environmental general manager into the executive. She developed a desire and a passion for operations and insisted on joining the operational side of the business. Her persistence paid off when she was appointed at the general manager of three mines.

Currently she manages three miners under the company's captive region and mentors young ladies throughout the organisation who wish to follow her lead. She would like to pursue more of a champion role for gender issues on the mine, but feels burdened by the everyday challenges and heavy deadlines.

Position: Participant 8

Alias: Nomfundo Madlala

Age: Early 50s

Occupation: Senior Health and hygiene advisor

Nofundo is a middle aged black woman born of South African descent in Swaziland during the throws of apartheid. Her parents were both teachers in the nearby missionary school she also attended. Her father was especially an advocate for education; he continually encouraged her to pursue Maths and Science and would reward her when she would perform well. She remained an outsider to the locals in Swaziland until she returned to South Africa after completing her matric.

She enrolled in a black university to pursue one of the only few options available to women at the time, education. She made the most of that opportunity and pursued her real passion, biology. She focused on biological subjects as part of her teaching degree hoping to have the opportunity to escape into something more in line with her dreams.

An opportunity came for her to apply for a scholarship to study a master's abroad in the USA. She applied and was awarded the Ronald Reagan scholarship. She packed her bags and sold all the furniture she owned, as little as it was, and went off to study. After her master's, she sort opportunity to do a PhD and completed that as well. After spending eight years in the US, she returned to South Africa and started working as a lecturer. After two years she sort other employment and received an offer for a very prestigious job in the government. When the travelling became excessive and her family responsibilities mounted, she sort other employment and found it in a mining company.

She is currently working as a senior advisor and is well accomplished in the company, but feels that mining is not her dream, nor has it ever been. She has always been pursuing biology and seeks another opportunity, preferably in international health for her to continue on in her purpose. She has a stable marriage, with two children and thinks that, that has made her a better person all around.

APPENDIX F

- Participant resumes-

Participant 1

Personal Information	
Alias	Lerato Masemula
Nationality	South African
Demographic	African Black Female
Age	24
Residence	Secunda, Mpumalanga

Educational Background		
Qualification	*Institution*	*Country*
BEng: Electrical Engineering	University of Pretoria	South Africa
BEng(Hons): Electrical Engineering	University of Pretoria	South Africa

Career Journey	
Company	Exxaro Resources Limited
Industry	Mining
Position(s)	Professional in Training: Electrical Engineer
Period	Jan 2012 to present

Participant 2

Personal Information	
Alias	Matlatsi Manono
Nationality	South African
Demographic	African Black Female
Age	24
Residence	Kriel, Mpumalanga

Educational Background		
Qualification	*Institution*	*Country*
NDip: Mine Surveying	University of Johannesburg	South Africa
BTech: Mineral Resource Management	University of Johannesburg	South Africa

Career Journey	
Company	Exxaro Resources Limited
Industry	Mining
Position(s)	Professional in Training: Mine Surveyor
Period	Jan 2012 to present

Participant 3

Personal Information	
Alias	Sue Pinache
Nationality	South African
Demographic	White Female
Age	40
Residence	Pretoria, Gauteng

Educational Background		
Qualification	*Institution*	*Country*
NDip	Vaal University of Technology	South Africa

Career Journey	
Company	Hira Power and Steels
Industry	Mining
Position(s)	Business Development
Period	2011 to present
Company	A Mining and Resources company
Industry	Mining
Position	CEO
Period	Nov 2007 to present
Company	Sasol Synfuels
Industry	Mining
Position	Operations Manager
Period	2000 to 2004
Company	Sud Chemie
Industry	Mining
Position	Business Development Representative
Period	2000 to 2004

Participant 4

Personal Information	
Alias	Diditle Ledwaba
Nationality	South African
Demographic	African Black Female
Age	24
Residence	Lephalale, Limpopo

Educational Background		
Qualification	*Institution*	*Country*
BEng: Industrial Engineering	University of Pretoria	South Africa

Career Journey	
Company	Exxaro Resources Limited
Industry	Mining
Position(s)	Professional in Training: Industrial Engineer
Period	Jan 2012 to present

Participant 5

Personal Information	
Alias	Masindi Raluare
Nationality	South African
Demographic	African Black Female
Age	26
Residence	Lephalale, Limpopo

Educational Background		
Qualification	*Institution*	*Country*
BEng: Mining Engineering	University of Pretoria	South Africa

Career Journey	
Company	Exxaro Resources Limited
Industry	Mining
Position(s)	Professional in Training: Mining Engineer Jan 2010 to Dec 2012 Mining Engineer Jan 2013 to present
Period	Jan 2010 to present

Participant 6

Personal Information	
Alias	Jill Smith
Nationality	South African
Demographic	White Female
Age	41
Residence	Johannesburg, Gauteng

Educational Background		
Qualification	*Institution*	*Country*
BSc: Geology and Zoology	University of Port Elizabeth	South Africa
BSc(Hons): Geology	Rhodes University	South Africa
MSc: Mineral Economics	University of Pretoria	South Africa
PhD: Economic Geology	Colorado School of Mines	USA

Career Journey	
Company	CSIR
Industry	Mining Research and Innovation
Position(s)	Competency Area Manager
Period	Nov 2010 to present
Company	Council for Geoscience
Industry	Mining research and innovation
Position	Non-Executive Director
Period	September 2012 to present
Company	Sound Mining
Industry	Mining research and innovation
Position	Associate
Period	Dec 2011 to present
Company	International Royalty Corporation
Industry	Mining
Position	Mining Analyst
Period	May 2009 to Aug 2009
Company	CSIR

Industry	Mining research and innovation
Position	Head: Strategic Development - Africa
Period	June 2002 to Aug 2005
Company	AngloGold Ashanti
Industry	Mining
Position	Senior Geologist
Period	Oct 1999 to June 2002
Company	Anglovaal – Target Exploration and Mine
Industry	Mining
Position	Geologist
Period	Jan 1996 to Oct 1999

Participant 7

Personal Information	
Alias	Nokwanda Jele
Nationality	South African
Demographic	African Black Female
Age	48
Residence	Witbank, Mpumalanga

Educational Background		
Qualification	*Institution*	*Country*
BSc	University of Transkei	South Africa
BSc (hons)	University of Transkei	South Africa
MSc	University of Maryland	USA
Ph.D (Biotechnology)	University of Pennsylvania	USA
Advanced Management	Insead	France

Career Journey	
Company	Exxaro Resources Limited
Industry	Mining
Position(s)	- Executive General Manager: Safety and Sustainability - May… to Jan 2010 - Executive General Manager: Captive Mining Region -Jan 2010 to present
Period	
Company	Astral Foods Limited
Industry	Consumer Goods, Fashion and Retail
Position	Independent Non-Executive Director
Period	8 May 2007 to present
Company	University of Pretoria
Industry	Higher Education
Position	Lecturer: Department of Genetics
Period	
Company	
Industry	
Position	Director of South African National Parks
Period	
Company	National Research and Technology Foresight Project

Industry	
Position	Senior Coordinator: Agriculture and Agro-processing Sector
Period	
Company	National Department of Environmental Affairs and Tourism
Industry	
Position	Deputy-Director General: Environmental Management
Period	2000
Company	Council of Scientific and Industrial Research
Industry	
Position	Corporate Manager: Biotechnology and Innovation Futures
Period	1999
Company	-
Industry	Basic Education
Position	Teacher
Period	-

Participant 8

Personal Information	
Alias	Nomfundo Madlala
Nationality	South African
Demographic	African Black Female
Age	54
Residence	Pretoria, Gauteng

Educational Background		
Qualification	*Institution*	*Country*
BSc.Ed	Univo	South Africa
BSc (Hons)	Univo	South Africa
MSc: Biochemistry and Molecular Biology	University of California	USA
PhD: Biology	University of Southern Califonia	USA

Career Journey	
Company	Exxaro Resources Limited
Industry	Mining
Position(s)	Health and Hygiene Advisor
Period	2006 to current
Company	Department of Science and technology
Industry	Government
Position	Director of Multilateral corporations
Period	2004 to 2006
Company	Department of Health
Industry	Government
Position	Deputy director
Period	1997 to 2004
Company	University of the Witwatersrand, School of Pathology
Industry	Higher education
Position	Researcher
Period	1995 to 1997
Company	Matabo High School

Industry	Basic Education
Position	Teacher
Period	1984 to 1986

APPENDIX G

- Reflection memos on analysis-

Affirmative action and career progression: 2013-09-10

Most of the women are of the opinion that affirmative action aided them in getting opportunities, but at the same time, they all agree that affirmative action will not make you a success. It will get you in, but it will not keep you in

Close social connections: 2013-09-10

All the women seems to be good at forming social relationships, all of them expressed that they had lots of good friends that they enjoyed spending time with. This is an indication that they are well adjusted human beings who have the ability to exist quite easily in society despite the choice of a non-traditional career

Humility is an important trait for a woman in mining: 2013-09-10

A lot of the women mention humility in addition to strength as an important attribute. They state that you have to respect the frontline men in order to get respect yourself, if you come with "I'm better than you" attitude, you will not be able to learn

Participant's 3 interview analysis: 2013-09-09

Sue went off on a tangent during the interview; she did not follow the structure provided to her at the beginning of the interview. Because of her status as a CEO, I did not want to be rude and stop her while she was talking, but in retrospect, I should have. Most of the information she gave was interesting, but has limited use. The details of how she got into mining are a bit sketchy and the chronology of the story cannot be clearly established.

Nokwanda Jele is different: 2013-09-10

Nokwanda is different from other participants as she did not express an interest for mining earlier in her life, she in fact went through several different positions in other industries, before entering mining, but not that she has entered the mining world, she has found her passion and feels that the challenges she face are rather energising

Professional transcriptions and proof reading: 2013-09-09

After I completed my interviews, I had them professionally transcribed at HR Elements. After I received all of them back, I proof read them and had a friend proof read them as well to ensure that they were at the right standard. Even though I took precautions getting my transcriptions done professionally and proof reading them twice, I still find minor mistakes, which is rather disheartening

South Africa is not ready for powerful and profound women leaders: 2013-09-10

Most of the women are of the opinion that South Africa is not ready for profound and powerful women leaders, even though women are ready to play the part; men are not ready to let women play the part

Starting my data analysis: 2013-08-18

When I started with my analysis, I first thought about the interviews I had conducted and thought about the information I received. This led to think of a few key codes grouped in the families. I decided these families from the categories I clustered my questions around; some were about the participant's childhood, while others were about their schooling years and career. Afterthis initial step, I went on to create more codes as I was going through the data. I would see new themes that fell into my families, but not my current codes, I would then add new codes to the families I have already identified. It was a fun process, but very time consuming, which led to bursts of frustration as my due date was creeping up very fast. I also started thinking about how I would analysis my data once I was done with my analysis.

Strength as an important characteristic: 2013-09-09

Most of the women, if not all, identify being strong as an important attributed for a women to have if they are to survive in the mining industry. They further expand by stating that you have to be assertive and thick skinned

The first woman in a specific mining environment: 2013-09-10

There seems to be a trend in the older ladies that they are the first women in the mining environment they enter. They had to face the teething pains that come with being the first of anything; no facilities, policies are not accommodating and plainly as well, people don't know how to treat you.

With the younger women, although they entered as one of few, they did not have to go through the same pains as they older women as the ground work has in a sense been laid already.

Types of older women: 2013-09-11

The older women represent two broad types of senior women in mining, on the one hand are those who entered mining before it became fashionable and were usually a pioneer or the first/second woman to enter the mine. The second type is those that are qualified in something else, in both my cases, science, and through that got into a mining company

Women versus men leadership: 2013-09-09

There seems to be a consensus among the women that the way men and women lead is different, with a slight bias towards the believe that women lead better than men

Working twice as hard as men: 2013-09-09

The theme of working harder or even twice as hard as men to get to the same position has thus far shown up in all 5 of the previous interviews I have analysed. It seems that women feel that their gender impedes them from attaining the same high positions as their male counterparts and thus have to go above and beyond the normal threshold of success to get minimal recognition