

# **GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY**

By

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## DECLARATION

I hereby declare that this dissertation submitted by me for the Master of Business Administration degree at the University of the Free State is my own independent work and has not previously been submitted by me at another university. I furthermore cede copyright of the dissertation in favour of the University of the Free State.

Kutlwano Gwendoline Takadi



**Signature**

20 January 2021

**Date**

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## DEDICATION

*“If you educate a man, you educate a person. But if you educate a woman, you educate a nation” - James Emman Kwegyir Aggrey*

This well-known African proverb has long been inspiring people around the world to aspire for education for all. To me, education is the key factor for women to enter the movement towards gender equality. I am a firm believer that women should take up their space in the corporate world because they have a lot to contribute, not only in technical competence but also in ensuring an optimal work environment/culture.

This thesis is dedicated to all the women climbing the corporate ladder, not only in the mining sector, and to the men who act as pioneers for women in the workplace.

## ABSTRACT

Mining has been inextricably intertwined with South Africa's political economy since the advent of large-scale and profitable mining in the 1860s. A keen study of the production and trade dynamics of the mining sector and their relations with the law, social norms and government policies and regulations, and how these have contributed to and impacted the distribution of national income and wealth, and their attendant dynamics, has been a reliable bellwether of the socio-economic vibrancy of the South African Republic through successive historical epochs. A key issue through these successive epochs has been labour issues generally and the participation of women in the mining sector labour force specifically.

Against this backdrop, the research reported in this dissertation had the primary objective of examining gender equality in top managerial positions in the South African mining company, Anglo American. The secondary objectives included an exploration of gender-related causes of women's non-progression to senior leadership positions; the determination of gender-related personal values among occupants of top and senior management positions in the company; and the development of a framework to reduce gender disparities within top and senior management at Anglo American.

To seek answers to these objectives, the research deployed a cross-sectional survey design within a transformative research paradigm. The research established that, although Anglo American has made considerable progress in ensuring gender parity within top and senior management positions and is generally performing well above the industry average, still more needs to be done to comply with the applicable legislative and policy instruments.

In distilling the insights from the research, the study formulated a framework through which the company can achieve the required gender parity at top and senior management positions.

**Keywords:** mining, gender equality, south african mining company, top managerial positions, women in mining, gender differences, women, women progression in mining, challenges of women in mining, anglo american

## TABLE OF CONTENTS

Declaration .....	i
Acknowledgements .....	ii
Dedication .....	iv
Abstract .....	v
List of Figures.....	viii
List of Tables .....	viii
List of Abbreviations .....	ix
Chapter 1 Introduction and Background .....	1
1.1 Introduction .....	1
1.2 Problem Statement.....	5
1.2.1 Research questions .....	5
1.3 Research Objectives .....	6
1.3.1 Primary research objective.....	6
1.3.2 Secondary research objectives .....	6
1.4 Research Methodology .....	6
1.4.1 Research design.....	6
1.4.2 Sampling strategy .....	7
1.4.3 Data collection method .....	7
1.4.4 Ethical considerations .....	8
1.4.5 Data quality check.....	8
1.4.6 Data analysis and interpretation.....	8
1.4.7 Data validity and reliability.....	9
1.5 Demarcation of field of study .....	9
1.6 Chapter layout of study .....	9
1.7 Conclusion .....	9
Chapter 2 Literature Review .....	11
2.1 Introduction .....	11
2.2 Transformation in the mining industry.....	14
2.2.1 The mining sector through a global lens.....	14
2.2.2 South African Mining Charter .....	15
2.3 Conceptual framework .....	19
2.4 Gender differences in mining senior management positions.....	20
2.4.1 Global perspective on gender differences in mining senior management positions .....	20
2.4.2 South African perspective on the gender differences in mining senior management positions .....	22
2.5 Gender differences in personal values .....	23
2.6 Gender differences in strengths and weaknesses .....	25
2.7 Strategies to enhance women’s participation in Anglo American.....	26
2.8 Conclusion .....	29

Chapter 3 Research Design and Methodology .....	31
3.1 Introduction .....	31
3.2 Research design .....	31
3.2.1 Epistemological considerations .....	32
3.3 Research methodology .....	34
3.3.1 Secondary data collection .....	35
3.3.2 Primary data collection.....	36
3.4 Data collection method.....	38
3.4.1 Instrument.....	38
3.4.2 Procedure .....	38
3.5 Data analysis.....	39
3.5.1 Qualitative data analysis .....	39
3.5.2 Quantitative data analysis .....	40
3.6 Ethical considerations .....	40
3.6.1 Obtaining of permission .....	41
3.6.2 Informed consent .....	41
3.6.3 Confidentiality .....	41
3.6.4 Voluntary participation .....	42
3.7 Conclusion .....	42
Chapter 4 Data Analysis .....	43
4.1 Introduction .....	43
4.2 Response rate.....	43
4.3 Analysis and interpretation of biographical data .....	43
4.4 Analysis and interpretation of questionnaire .....	47
4.4.1 Reliability .....	47
4.4.2 Objective 1: Gender differences relating to why women do not progress to senior leadership positions .....	48
4.4.3 Objective 2: Challenges experienced by women in mining.....	54
4.5 Conclusion .....	56
Chapter 5 Conclusion and Recommendations.....	58
5.1 Introduction .....	58
5.2 Conclusions of the study .....	58
5.3 Recommendations .....	60
5.4 Limitations of the study.....	61
5.5 Conclusion .....	62
References.....	63
Annexure A. Informed Consent.....	76
Annexure B. Permission Letter .....	83
Annexure C. Survey Analysis for Kutlwano Takadi .....	91

## LIST OF FIGURES

Figure 4.1:	Perceptions of women in mining .....	48
Figure 4.2:	Career advancement for women in mining.....	51
Figure 4.3:	Challenges experienced by women in mining .....	54

## LIST OF TABLES

Table 1.1:	South African mining and quarrying sector .....	4
Table 2.1:	Employment equity compliance targets and weights.....	16
Table 2.2:	Employment equity statistics 2015 vs 2019 .....	27
Table 3.1:	Total sample size of employees in top and senior management positions .....	37
Table 4.1:	Demographic characteristics of the sample of top and senior managers at Anglo American Mining (South Africa) N=248 .....	44
Table 4.2:	t-test showing means, standard deviations and significant differences between male and female perceptions of women in the mining industry.....	49
Table 4.3:	t-test showing means, standard deviations and significant differences between male and female opinions of women's career advancement at Anglo American South Africa .....	52
Table 4.4:	t-test showing means, standard deviations and significant differences between the opinions of males and female about challenges experienced by women at Anglo American Mining South Africa .....	55

## LIST OF ABBREVIATIONS

ASM .....	artisanal and small-scale mining
CEOs .....	chief executive officers
HDSAs .....	historically disadvantaged South Africans
ILO .....	International Labour Organization
JSE .....	JSE Limited – previously the JSE Securities Exchange (2000–2014) and the Johannesburg Stock Exchange (1887–2000)
MCSA .....	Mineral Council of South Africa
PPE .....	personal protective equipment

# CHAPTER 1

## INTRODUCTION AND BACKGROUND

### 1.1 INTRODUCTION

Anglo American plc (hereafter referred to as Anglo American) is a multinational British mining company with headquarters in Johannesburg, South Africa, and London, United Kingdom. It is the largest producer of platinum, commanding about 40% of the production globally. This noble metal is used in “catalytic converters, laboratory equipment, electrical contacts and electrodes, dentistry equipment and jewellery”. The company is also the most prominent producer of “diamonds, copper, nickel, iron ore and metallurgical and thermal coal”, with an operational footprint in “Australia, Botswana, Brazil, Canada, Chile, Colombia, Finland, Namibia, Peru, Shanghai, Singapore, South Africa, the United Kingdom and Zimbabwe” (Anglo American, 2019).

Certain metrics capture the magnitude of Anglo American’s global operation. On the production side, as reported in the Integrated Annual Report of 2019 (Anglo American, 2019) – apart from platinum which brought in \$2,000 million, diamonds that brought in \$558 million, and copper that brought in \$1,618 million – Anglo American produced iron ore worth \$3,407 million, metallurgical coal worth \$1,707 million, thermal coal worth \$125 million, nickel and manganese worth \$634 million, and corporate and other services worth \$43 million (Anglo American, 2019: 2–3).

On the human resource side, Anglo American has around 63,000 employees spread across the jurisdictions listed above, with an overwhelming percentage (45,000/71.4%) living in South Africa. On the wages and benefits side, the company paid out \$3,467 million in the reporting period 2018/19. Over the same period, the company paid \$3,035 million in taxes and spent \$3,759 million in local procurement across all its operational jurisdictions (Anglo American, 2019: 2–3).

The above metrics notwithstanding, however, Anglo American is presently among the companies within the mining sector, which have fewer females than males in top managerial positions. Anglo America, being a company that is prominent in the mining sector due to it being the largest mineral producer, is thus legitimately expected to set policy and operational benchmarks for the overall mining industry. The under-representation of females in top managerial positions at Anglo American is symptomatic of a specific obstacle relating to the low level of female representation and participation in all ranks within the industry (PricewaterhouseCoopers, 2013). The lack of female

representation in the top managerial positions at Anglo American is amplified by the potential impact that holders of top management can have on an organisation. According to the description of managerial positions as per the Anglo American Global Banding Framework, people in top management positions are ultimately responsible for an Anglo American division or for leading a group function. This means that top management occupants set the highest level of business strategy for the group or a business unit.

However, there is still a substantial under-representation of women in many areas of leadership and decision-making processes globally, and not only in Anglo-America (Fortin, Brian & Michael, 2017; Maseko, 2013). This is despite the emphasis that has been increasingly put in many socio-political and corporate studies worldwide on gender equality (Eftimie, Heller & Strongman, 2009). In the mining industry, female under-representation continues and there is ongoing public pressure to resolve rising levels of gender disparity in industries dominated by men (Eftimie, Heller & Strongman, 2009). In Africa, gender inequality is seen in many ways in the face of the global adoption of democratic laws that derive from the conventional and cultural norms of society (United Nations Development Program, 2019).

A man is regarded as the apparent earner who has a degree of power over a woman. On the other hand, the woman is considered submissive and a nurturer, who continues to tolerate male dictatorship because she lacks access to education and the income-generating opportunities required. Badenhorst (2009) suggests that, relative to their male counterparts, females are seen as human species with inferior masculinity. These opinions have been misinterpreted as gauging inferior assessments of the abilities of women to perform certain roles in the business world (Badenhorst, 2009). Socio-cultural theorists have often historically regarded women as inferior to men, and have given men opportunities related to gender, thus excluding women (Mello & Phago, 2007).

There have been assumptions that women, based on their feminine body structure, cannot perform labour-intensive tasks, such as mining (Botha & Cronjé, 2015b). In the past, females were forbidden to work in basic mining operations in the South African mining sector (Zungu, 2012). The domination of males in the mining sector has been exacerbated by the females' avoidance of working in the mines due to the nature of the work.

Some countries have been seeing slow improvement of women participation in senior management positions (Einarsdottir, Christiansen & Kristjansdottir, 2018), but this remains a critical obstacle in South Africa (Shabangu, 2015). Due to the continued low

women's participation and slow advancement of women into senior management roles, the South African mining sector has received significant attention for lack of transformation (Khoza, 2015).

South Africa generates more female graduates than males, and research indicates that in the business world, South African females have a high desire to succeed. Crucially, a significant number of women, comparable to men, have the confidence and a deep desire to achieve the top senior leadership positions and, given a chance, can achieve that stature (Fajardo & Erasmus, 2017). There are still only a few women in senior management positions, despite the available resources of female graduates and the mandated gender quotas proposed as a policy mechanism to encourage female's career advancement to the top positions (Maida & Weber, 2019).

The implementation of the Constitution (South Africa, 1996) gave rise to laws, policies and regulations designed to counterbalance the socio-economic and political problems occasioned by those of the previous apartheid government. Laws such as the "Mining Charter" meaning the "Broad-Based Socio-Economic Empowerment Charter for the Mining and Mineral Industry" developed in terms of "section 100 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)"; was designed to transform the mining industry by considering the "historically disadvantaged persons" who were previously marginalised.

In order to accelerate the employment of females in core mining activities, the Mining Charter was put in place (Mudimba, 2017). In 2009, the Mining Charter targets for women in mining were reviewed by the then Minister of Mineral Resources and reiterated the critical growing concerns over the pace that women were being appointed into senior and board-level roles within the mining industry (Shabangu, 2015). To address this, compliance was linked to the mining rights and the license to operate, with a condition to revoke the licenses, should mining companies not meet compliance by 2009. The Mining Charter further suggested a 10% placement of women in the main mining roles (core skills). Instead of viewing this issue from a physiological point, this must encourage government and other key stakeholders to approach from a different angle, the matters relating to gender equality and women inclusion, especially those attempting to ascend the top leadership positions. It is further noted by Dlanjwa (2018) that gender disparity is exacerbated by the values as well as the social and cultural norms that are embedded within the South African cultures. In addition, the relationships, structures, beliefs, attitudes and actions of people and organisations in a society profoundly embrace these social constructs (Patel, 2013).

The history of the mining sector in South Africa and the statistics gathered from the Commission of Employment Equity (2019), demonstrate that the male vs women representation in the mining sector is still dominated by males. Table 1.1 below depicts the data:

*Table 1.1: South African mining and quarrying sector*

WORKFORCE PROFILE FOR ALL EMPLOYEES	MALE				FEMALE				FOREIGN NATIONAL		TOTAL
	African	Coloured	Indian	White	African	Coloured	Indian	White	Male	Female	
Top Management	301	38	37	798	104	10	18	114	44	6	1,470
Senior Management	1,073	123	195	2 530	285	41	95	430	112	20	4,904
Middle Management	5,178	606	407	6,689	2,054	217	266	1 789	389	63	17,658
Junior Management	42,072	3,270	532	18,788	9,882	842	299	4,249	3,511	84	83,529
Semi- Skilled	128,275	3,997	104	2,799	18,437	1,003	107	1,647	24,211	203	180,783
Unskilled	70,511	728	14	583	15,758	222	7	86	12,248	1,040	101,197
Temporary employees	4,786	322	34	875	1,996	192	26	175	128	9	8,543
<b>Total</b>	<b>252,196</b>	<b>9,084</b>	<b>1,323</b>	<b>33,062</b>	<b>48,516</b>	<b>2,527</b>	<b>818</b>	<b>8,490</b>	<b>40,643</b>	<b>1,425</b>	<b>398,084</b>

Source: Commission of Employment Equity (2019)

Table 1.1 above indicates the female percentage as 15.5% (61,776/398,084).

## 1.2 PROBLEM STATEMENT

Anglo American mining reported a high rate of males in top and senior management positions in mid-2019. The Anglo American global banding framework defines *top management* as people who set the highest level of business strategy for the group or a business unit; and *senior management* as individuals who lead either a major function within a division or part of a group function. Women are estimated to make up just 10% of the global mining workforce, while South Africa accounts for 21%. This definitely adds to the limited percentage of women in top management positions, and also shows that there is no gender balance.

There have been many studies depicting the benefits of a gender-balanced workforce in top and senior management positions. Amongst others are the benefits of diversity of thinking and problem-solving, increased profitability, eradication of unconscious bias, and ensuring women's needs are catered for. Without a gender-balanced workforce in the top and senior management positions, the environment is not conducive for women, as men do not understand the factors and challenges affecting women. The industry will not transform and women will continue to be marginalised in matters, such as recruitment, promotions, retention – because, due to like attracting like, men will keep favouring other men.

The challenge of low numbers of women persists, although the skills required for women in top and senior management positions are present, as a result of a high percentage of female graduates compared to males (Fajardo & Erasmus, 2017). The quotas specified in the legislation such as the “Mining Charter”, the “Broad-Based Black Economic Empowerment Act, No 53 of 2003”, and the “Employment Equity Act, No 55 of 1998”, seem to not be achieving the purpose as there is very little progression of females into top and senior management positions.

### 1.2.1 Research questions

Given the challenges identified in the literature on the topic, it is imperative to answer the following questions:

- Are there gender equality differentials in the top managerial positions in South African mining companies?
- What are the gendered differences that constrain women's progress onto senior management and leadership positions in South African mining companies?

- Are there factors prohibiting female progression to top and senior management positions in South African mining companies?
- What would the architecture, contours and contents of a framework designed to reduce gender differences in senior management and leadership positions in South African mining sector generally and in Anglo American specifically, look like?

### **1.3 RESEARCH OBJECTIVES**

#### **1.3.1 Primary research objective**

The primary research objective of this study is to examine gender equality in top managerial positions in a South African mining company.

#### **1.3.2 Secondary research objectives**

The study seeks to achieve the following objectives:

- to explore the gendered differences that constrain women's progress onto senior management and leadership positions in South African mining companies;
- to determine factors that prohibit females from progressing to top and senior management positions in South African mining companies; and
- to develop a framework to reduce the gender differences in senior management and leadership positions in South African mining sector generally and in Anglo American specifically.

### **1.4 RESEARCH METHODOLOGY**

#### **1.4.1 Research design**

The study employed a cross-sectional survey design combining quantitative and qualitative approaches. This design enabled data to be gathered at one point in time by making inferences about a population of interest (top management) (Lavrakas, 2008). A quantitative approach for the current data in numerical form, was also adopted in the research. The statistical analysis included the use of the *t-test* to compare the variables of interest being the "males and females". To determine characteristics among respondents, a frequency analysis was employed. The qualitative dimension of the design, which largely covered the deep literature review, was executed through content analysis.

## **1.4.2 Sampling strategy**

### **1.4.2.1 Study population**

The study was focused on the four main business units (i.e., Platinum, Coal SA, Kumba Iron Ore and De Beers) within Anglo American South Africa, concentrating on the top and senior managers. According to Anglo American South Africa's employment equity figures of 30 June 2019, the top and senior positions in the aforementioned business units were 526 (415 males and 111 females).

### **1.4.2.2 Sample**

The entire population served as a sample for this study; thus 415 males and 111 females. The sample size was determined by the low numbers of people in the top management positions in the company; therefore, the study included all males and females in top and senior management positions as defined in Section 1.2, surveyed from four business units within the company.

A census was conducted for both males and females occupying top and senior management positions, given the characteristics of the study.

### **1.4.2.3 Sampling Technique**

To select top and senior managers within the organisation, a stratified random sampling technique was employed. Gender further classified the strata. Stratified sampling involves categorising the population into groups before research is carried out in each of the specified groups (Singh & Mangat, 1996).

## **1.4.3 Data collection method**

A self-structured questionnaire was distributed to the four mining business units' employees for self-completion. Before that, the Human Resources division sensitised the employees to volunteer in the participation of the survey through an e-mail. That e-mail contained a link to redirect the respondents to the questionnaire with the informed consent in front. The Human Resources division acted as gatekeeper, distributing the e-mails with the link to the electronic questionnaire to top and senior managers, and sending reminder e-mails to encourage maximum participation.

All the details of the study were outlined in the introductory letter. Respondents were given a week to complete the survey.

#### **1.4.4 Ethical considerations**

According to Discroll and Brizee (2010), ethical concerns arise when data is collected from people. The researcher works for De Beers, one of the Anglo American business units, which gives rise to conflict of interest. Conflict of interest was declared. As mentioned, the Human Resources division acted as a gatekeeper and communicated with the respondents in order to isolate the researcher from the study as a conflicted individual.

Other ethical issues in this proposed study were dealt with in the following manner:

- Mining authority consent was obtained, as was approval from respondents.
- The questionnaire was completed in English.
- All results were treated confidentially.
- No names were written on questionnaires.
- All data will be destroyed after six months.
- Data was linked to participants.
- Respondents had the right to withdraw.
- Respondents had the right not to participate.
- There were no monetary gains of any sort.

#### **1.4.5 Data quality check**

At the initial cleaning point, error detection techniques using descriptive statistics zooming in on the likeliness of values, standard deviations of variables and other dispersion measurements were used, involving the detection and elimination of errors and anomalies in the data collection. In order to ensure accuracy and overall "cleanliness" of data, data was checked using the related statistical package's R command files when questionable values and outliers were investigated and solved; this was done to ensure consistency.

#### **1.4.6 Data analysis and interpretation**

The statistical package R was used for the analysis of the quantitative data. A frequency analysis was used to accomplish the first and second objective. A descriptive analysis was carried out first, to identify respondents' characteristics, and assess their personal

values; furthermore, analysis of the data served in the conclusion of gender equality. In order to determine the mean value comparisons, a *t*-test analysis was employed.

#### **1.4.7 Data validity and reliability**

The two most critical aspects to be considered when determining a particular instrument are reliability and validity. These aspects serve as guidelines for determining whether a successful measure is given by the study. In the analysis, the test to assess the construct of reliability is necessary to substantiate whether the instrument used, confirms the variables' discrepancies between the two genders and by job roles (positions). Reliability and validity tests were performed on the measurement instrument to test whether it calculated what it was meant to calculate. Cronbach's alpha ensured the determination of the coefficient value of the scales.

### **1.5 DEMARCATION OF FIELD OF STUDY**

The study was limited to mining employees (males and females) holding top and senior management positions in Anglo American mining operations. The individuals sampled completed an electronic questionnaire. The study was carried out in the Human Resources Management field.

### **1.6 CHAPTER LAYOUT OF STUDY**

The study contains the chapters as follows:

- i. Introduction
- ii. Review of literature
- iii. Research Methodology
- iv. Discussion of Findings
- v. Conclusions, discussions and future considerations

### **1.7 CONCLUSION**

It is clear that, despite mechanisms to resolve the gender gap through legislative instruments, the under-representation of women in top mining positions has remained a global issue for decades. Just a few females have navigated their way to top and senior leadership positions within the mining companies in South African. While more female graduates than male graduates have been reported in South Africa, and

research shows that females have a strong desire for success in the South African corporate world, they do not advance in large numbers into top management positions.

Anglo American, the world's largest producer of several mineral resources (copper, diamonds, iron ore, nickel, platinum and metallurgical and thermal coal), is facing challenges of gender equality in top management positions to date. Therefore, it is vital to explore gender equality in top management positions in Anglo-American South African mining company and the factors that lead to the limited percentage of women as opposed to men in top management positions.

The results and recommendations contained in this study are critical and relevant in other sectors or associated industries.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

Different authors often describe *gender equality* differently, subject to the context used. The International Labour Organization (ILO) is a credible, globally recognised organization responsible for governing international labour standards and promoting women's equality in the workplace. Gender equity is described by the ILO's *Action Plan, 2016–2017* (2016) as a mechanism to enable both men and women to influence, participate and benefit from the development process (ILO). Structural obstacles should be removed in order to reach such a position within the work environment. The outcomes of change or transformation should include more equitable relationships of authority, shared decision-making as well as equal access and ownership of productive resources and benefits for women (Mudimba, 2017:37). This observation is important because the South African Constitution, 1996, borrows heavily from international law and best practices. However, key to operationalising South African democracy post-1994, was a pledge to equality, including gender balance and the strengthening of females. The establishing standards of the Constitution incorporate human rights, equity and opportunities for all in South Africa (Department of Women, 2015). The Constitution protects the privileges of all people and allows them to use the law to their advantage, and to enjoy freedom from segregation based on sexual orientation.

Balance is likewise given noticeable force in the introduction to the establishment, where it is expressed that "South Africa belongs to all who live in it, united in our diversity" (Department of Women, 2015: 21). This is significant as females are also considered diverse. The constitutional vision of the acknowledgement of uniformity, including equity among males and females, is an ideal to be sought and accomplished through the application of the Constitution.

A case in point is the South African mining sector. It has been remarked, however, that active engagement and female inclusion in mining institutions' decision-making will not offer them a democratised, stable and safe workplace (Mudimba, 2017). For an informed managerial team, consultation and participation of the affected parties by mining houses is inevitable. Similarly, there is a crucial need for the current institutional and control structures to be revised to direct mining and labour issues, which are essential for promoting women's working conditions (Mudimba, 2017). For an example, the Portfolio Committee (Women in the Presidency) carried out an oversight visit to

Limpopo in 2015, whereby it was emphasised that the mining company (Samancor) needs to transform regarding gender equality. The organisation was found to be overwhelmingly male in senior management roles, with no female representation (Commission for Gender Equality, 2017).

Women in Mining South Africa conducted research; the findings proved that women have to work hard to prove themselves in each project they carry out in order to occupy a more senior role within a mining company. Additionally, women are expected to outperform their male counterparts who apply for the same job (Commission for Gender Equality, 2017).

Another contest is in the long working hours, as mining companies provide an inflexible work environment. Although males have enough time to perform their specific tasks, females also have to deal with family tasks that include caring for their families (Giddens & Sutton, 2013). This also clashes with the life and work balance of a woman.

It is therefore worth noting that the aforementioned constitutional right has been implemented to a very low satisfaction level. In spite of the 44% expansion in the statistics of South African women coming into the workforce, South African women have, for quite some time, been linked to low rates of employment (Statistics South Africa, 2018). By and large, these are women head households with at least one or more children (Hall & Mokomane, 2018). In any event, when these women accomplish work, they frequently earn less than the lowest pay permitted by law and battle to realise their dreams in the process (Agero & Guhao, 2016; Hall, Richter, Mokomane & Lake 2018; Makhumalo, 2015; Zulu, 2017). The employment fluctuations among women and men imply that employment conditions have remained altogether gendered (Hall & Makomane, 2018; Posel & Rogan, 2018).

Many social groups have reported that the mining industry has not given much regard to the needs of women in the work environment due to the fact that their exclusion starts at the decision-making table (Hill, Madden & Ezpeleta, 2016). Furthermore, females were disallowed to get involved in the consultative process engagements aimed at testing future mining operations at the various mining companies. As a consequence, whether women work underground or in top or senior management roles, "their needs remain unaddressed" (Hill et al, 2016).

Mine work includes, by its inherent nature, the handling of equipment and instruments manually, in which the size and types of such equipment are appropriate for the stature

and strength of men (Zungu, 2011). While many of the mining tasks are getting automated, the industry will ultimately remain “labour-oriented”, as manual tasks would still need to be undertaken (Wynn, 2001:34). Such tasks cause back injuries for miners, as well as musculoskeletal disorders (Badenhorst, 2009). Generally, the manual material handling abilities of females are usually slightly lesser in comparison to those of males; this can be partly attributed to the variations in the strength of their muscles. The lifting power of a female is usually 60% to 70% of the strength of a male (Ashworth, Molapo, Molefe, Schutte & Zitha, 2004). Zungu (2011:18) positions a need for improved education and understanding of the “safe limits” of women who handle equipment and instruments in the mining workplace. In addition, females cannot use the equivalent abilities to lift and handle heavy items and materials as their male counterparts. For female appointments in mining occupations, women’s body build and height should be considered (Zungu, 2011).

In general, and across different sectors, the representation of women remains low, especially representation of women in senior roles: This is demonstrated in the Fortune 500 companies, where women CEOs and women members of boards of directors make up 27% (Glass, Cook & Ingersoll, 2015). In South Africa, the population of women is 51.2%, but only 20.7% are appointed as directors of JSE listed companies (Bosch, Van der Linde & Barit, 2020). Women in leadership positions are suggested to have a pivotal role within companies, such as enhancing financial performance, decision-making, consumer insight, and corporate governance enforcement, as well as building and cultivating talent (International Labour Organisation, 2015). Furthermore, the Deloitte report on diversity and inclusion (Bourke & Dillon, 2018) suggests that companies embracing cultural differences are six times more likely to be innovative.

The statistics depict that women are not getting to the top sufficiently, and there are not just glass ceilings but also glass walls that are making it difficult for women to progress to the top (ILO, 2015).

This chapter examines the factors underlying the persistent and consistent exclusion of females in managerial positions in a South Africa mining company. It explains the Mining Charter, the transformation background, and the legislation governing the mining industry. It also discusses gender differences in leadership positions, in personal values and in strengths and weaknesses in the industry of interest.

## **2.2 TRANSFORMATION IN THE MINING INDUSTRY**

### **2.2.1 The mining sector through a global lens**

A lack of meaningful jobs and educational development, along with weak mentoring programs and career pathways, are the main challenges facing women in the mining industry globally. A pioneer in American mining research, Suzanne Tallichet, launched an investigation in the world of women miners in the early 1990s; she spent months in the West Virginia, in a community hosting a coal mining company (Mercier, cited in Lahiri-Dutt, 2011). The discovery she made in the mining environment was that women were faced with enormous obstacles, such that they were prevented from transferring to more professional positions from low-paying tough jobs. Women were not permitted to learn new skills to operate machinery even after attaining skilled positions; they were also not given requisite training (Mercier, cited in Lahiri-Dutt, 2011).

Another study conducted by Women in Mining in Canada (2010) found that women faced major obstacles in being employed and accepted in the mining industry. It is reported that women faced challenges in improving their jobs and holding senior positions in the mining industry, with specific reference to senior management and executive positions, which, the report averred, were the hardest to occupy. The challenges of climbing the corporate ladder reportedly culminated in gender-related barriers, including work culture that is male-dominated, women's capabilities being misconceived, lack of supportive working environments and supervisory relationships, absence of mentors and senior role models, also, inadequate professional and career growth. As a result, the challenges affect personal characteristics, for example, lack of confidence, low self-esteem and lack of assertiveness in work environments (Women in Mining Canada, 2010).

Closer to South Africa, in Malawi, the mining sector has a huge grouping of women compared with the other different divisions in the nation, and there are progressing endeavours to help their interest. A 2002 study set the number of females working in artisanal and small-scale mining (ASM) at around 4,000, representing 10% of the sector (Hentschel, Hrushka & Priester, 2002). However, given the expansion in ASM activities and the growth of mining in Malawi over the previous decade, this number has the potential to become far more prominent. With high levels of poverty in Malawi, females bear the brunt of it excessively. Of the absolute percentage of people living beneath the poverty line, females lead with 67% (Malawi, Department of Population, 2012). Accessing openings in the work force is an ordeal, especially with few females having any academic qualification. This limits women to employment in low-paying jobs.

Opportunities to attain academic qualifications strongly diminishes for young females as they draw closer to adulthood, and early marriage is common.

Worldwide improvement markers show that females face extensive burdens compared with men in Malawi. The United Nations Development Program's Gender Development Index (United Nations Development Programme, 2019), which estimates gender-based shortfalls in human improvement accomplishments by representing contrasts between females and males in the components of well-being, skills, and socio-economic status, ranks Malawi at number 4. This means it is classified as having a medium to low improvement accomplishment for females compared to what is determined as the standard for general human improvement accomplishments in the nation. The Gender Inequality Index (United Nations Development Programme, 2019), which paints a fuller picture of the disparities between males and females, shows that females are increasingly impeded in Malawi (Malawi, 2012). In spite of these inconveniences, the Constitution of Malawi maintains a balance between males and females, and forbids gender-based discrimination in any area of labour. The government of Malawi has repeated its promise to advance gender balance by marking territorial of such practice and protecting females against such gender differences.

### **2.2.2 South African Mining Charter**

Mining as an occupation was initially reserved for men in South Africa: the mining law (South African Minerals Act, 1991 [Act 50 of 1991]) did not permit females to work underground (Moyo, 2010). Moreover, the South African Minerals Act, 1991, imparted the information in that mining is not a domain for women to look for work (Moyo, 2010). However, the new democratic government of South Africa approved various techniques and legislations that accommodated historically disadvantaged South Africans (HDSAs), including women, by opening up the mining sector, in line with its economic empowerment policy. The new government transformed the landscape of the workforce in companies, including mining companies, by introducing acts, such as the "Employment Equity Act, 1998 (Act 55 of 1998)", the "Mineral and Petroleum Resources Development Act, 2002", and the "Broad-Based Economic Empowerment Act, 2003". These Acts were aimed at corporates to change their demographic profiles by employing more HDSAs in the mining sector. This meant that women should hold positions equal to those of men by filling higher positions in mining and in other sub-sectors they rarely formed part of before (United States Geological Survey, 2010).

The Mineral and Petroleum Resources Development Act, 2002, is a specific legal instrument aimed at redressing the discrimination against the HDSAs that occurred during the apartheid era, and to facilitate the overall transformation of the mining sector. The provisions of Section 100 of the Mineral and Petroleum Resources Development Act, 2002, enabled the mining minister to develop a broad-based socio-economic empowerment charter, the “Mining Charter”. The first Mining Charter was gazetted in 2004 with the explicit intention of advancing the participation of HDSAs in the mining industry. It included targets that mining companies must meet in line with their transformation efforts. From that point forward, positive outcomes were gradually observed, increasing the number of females employed in the mining sector. In 2011, women employed in the mining sector were 20,000. In 2012, the figure was 52,000 (South African Institute of Race Relations, 2012): a gigantic improvement of 160%. Despite this achievement, women remain on the fringes of the industry, given the low representation of women occupying boards positions, senior management and supervisory roles within the mining companies; those are still predominantly held by the white race (Botha, 2014).

The Mineral Council of South Africa (MCSA), whose mandate is to act as a principal advocate for mining in South Africa, stated in the *Facts and Figures Pocket Book 2019*, that, since the adoption of the Mineral and Petroleum Resources Development Act in 2002 and the first Mining Charter in 2004, the number of women in mining among its members had increased significantly from 3% to an overall 20% in 2019. The MCSA highlighted that the increase in representation had been realised across the various job categories. In September 2018, a revised Mining Charter was gazetted (no. 41934) outlining the employment targets for HDSAs. The targets are outlined in Table 2.1 below.

*Table 2.1: Employment equity compliance targets and weights*

<b>Element description</b>	<b>Compliance target %</b>	<b>Weight</b>
<b>Board</b>		
Total representation	50%	2%
Female representation	20%	2%

<b>Element description</b>	<b>Compliance target %</b>	<b>Weight</b>
<b>Executive Management</b>		
Total representation	50%	4%
Female representation	20%	3%
<b>Senior Management</b>		
Total representation	60%	3%
Female representation	25%	3%
<b>Middle Management</b>		
Total representation	60%	2%
Female representation	25%	2%
<b>Junior Management</b>		
Total representation	70%	2%
Female representation	30%	2%
<b>Employees with disabilities</b>		
Total representation		
Female representation	1,5%	2%
<b>Core and critical skills</b>		
Total number of employees	60%	3%
<b>Total</b>		<b>30%</b>

Source: Broad-Based Socio-Economic Empowerment Charter for the Mining Mineral Industry, 2018.

The targets depicted in Table 2.1 above measure the HDSAs in proportion to provincial or national demographics. The first reporting on the implementation of Mining Charter

2018 was expected to be on 31 March 2020 but the Covid-19 phenomenon has delayed the release of these statistics. However, given overall government insistence on compliance in the sector, the figures are expected to show improvements in critical empowerment indices.

Taking the MCSA figures in isolation does not give a full representation because not all companies in the mining sector are affiliated and are members of the MCSA. A more accurate record of the statistics of the workforce in South Africa is provided by the Commission for Employment Equity, which was established in terms of section 30 of the Employment Equity Act, 1998. The intent of the Employment Equity Act is to promote equal opportunities and fair treatment of employees in the workforce by eliminating any unfair discrimination, and implementing affirmative action measures in order to redress the hindrances which people from the designated groups encountered before 1994. Designated groups are all those who fall within the definition of HDSAs: Africans, Indians and coloured people, all women and all people living with disabilities (Mineral and Petroleum Resources Development Act, 2002). The statistics per the Commission for Employment Equity (2019) demonstrate an increase in the representation of women from 13% in 2015 to 15.5% in 2019. Broken down into occupational levels, the figures for women in top management positions increased from 16.6% to 20.7% and for women in senior management positions increased from 19.3% to 21.6% in 2015 and 2019, respectively. The increase is not substantial over five years, taking into account the various means to ensure that women are accommodated through legislation promulgations and diversity, as well as inclusion drives within companies.

Notwithstanding any good intentions, the launch of gender equality in the male-dominated mining industry continues to be one of the major unfair practices in the country, including other challenges that go along with placing women in the core functions within the mines (Harmony Gold Mining Company, 2008). Promoting the participation of women in the mining industry was, and remain, a non-stress-free task for mining companies. The mining companies continue to face challenges in reaching the targets set by the Mining Charter; this inability threatens their mining licenses to operate, as they stand to lose the licenses due to non-compliance (Mudimba, 2017). In addition, mining companies ought to find suitable women to employ in high mining positions because women refuse to be viewed as simply filling numbers, but would rather be taken as worth the appointment (Mudimba, 2017).

### 2.3 CONCEPTUAL FRAMEWORK

In order to be able to analyse both the broad and materialistic conditions shaping possible reasons why women do not hold higher positions in mining, a feminist political economic analytical framework was employed to examine gender relations in mining. The feminist political-economic theory allows for an attention to be placed on the relationships between production, reproduction and exchange (Rai & Waylen 2013), and the foundational significance of gender relations in structuring economies and policies. The interdependency of productive and reproductive work is essential to feminist political-economic analysis, knowing that the generative economy also intensely differentiates the options that men and women have to partake in labour market activities, as well as how they experience work conditions subsequent to that employment (Barrientos, Dolan & Tallontire, 2003).

For this study's purpose, gender analysis is based on the understanding of gender as a social relation or foundation that is embedded in all the social processes of daily life, and social organisation (Risman, 2004). This basis requires not only attending to the *display of gender differences*, meaning how those who look like women and men are treated differently but also looking into the ways in which their values are hierarchically set for women and men. Through understanding the aforementioned, the required approach to gender structuring in the mining industry would mean going beyond positioning women relative to men.

Feminist geographer Lahiri-Dutt (2012) has proved that the reading of the mining sector in terms of gender binaries yields a reductionist reason why women are regular passive victims of mining. Not only is this an incorrect description of women, but it also shuts off the "social and material contexts or historical understandings of women and work" (Lahiri-Dutt, 2012: 200). The author suggests that a focus must be on gender roles and relations in mining communities, to be in a better position to understand how and why women and men uniquely interact with and are impacted by mining. Lahiri-Dutt's analysis resounds with the extensive feminist political economy research that indicates forms of women's subordination are entangled in formal and informal occupations in multifaceted ways that go further than the operation of a gendered division of labour (Turshen, 2016).

It is worth noting that women always carry their social positions with them (Pearson 2014). However, the exchange of labour in informal financial prudence is extremely gendered and stratified with racial, ethnic or regional lines (Kabeer, 2012). Women tend to navigate occupational options within gendered social institutions (Whitehead, 2007),

power relations, and other dependencies that are themselves difficult and constantly evolving, including in industrial mining sites (Benya, 2015a, 2015b). Hence, answers to questions about how women might advance to senior managerial positions require an understanding of how gender operates to structure its values and how women navigate those structured values. Kabeer (2012) suggests that it is important to find out what explains women's prevalence at the survival-orientated, informal end of the business field, where there is very little sign of active choice. The question of choice probes the perceived alternatives at women's disposal and, thus, distinguishes choices made by females in the business world at different points of the continuum (Kabeer, 2012).

## **2.4 GENDER DIFFERENCES IN MINING SENIOR MANAGEMENT POSITIONS**

### **2.4.1 Global perspective on gender differences in mining senior management positions**

Research studies have proven the business benefits of having a diversified board and, in some countries, legislation has ensured that this takes place. Although the previously mentioned ILO and Deloitte reports concur on the positive impact that gender diversity has on the financial and social achievement of companies, the purpose is not to draw conclusions on quotas or legislation, but to identify and analyse the current situation in the mining industry regarding women in senior executive positions (Aluchna & Aras, 2018).

Research shows that women's statistics in the mining industry are low, most especially in the executive or senior management positions, compared to any industry group globally. Women on boards significantly contribute to companies' performance, especially regarding the financial aspect (Devnew, Ber, Torchia & Burke, 2018). Galbreath (2011) discovered that the more company boards have gender diversity, the more they boost the confidence of potential investors. The author further suggested that the involvement of women in senior managerial positions guarantees the effective enforcement of codes of ethics to ensure investments and shareholders' funds are not misappropriated.

Other studies reported that enhancing the gender diversity of senior management has the potential to improve corporate governance as female directors can help alleviate fraud (Capezio & Mavisakalyan, 2016). Following the validation, many studies showed that, on average, companies with female board directors perform better than companies without female directors (Ionascu, Ionascu, Sacarin & Minu, 2018).

Mining is considered the most challenging industry when it comes to the gender mixture compared to other industries, with women in the top 500 mining companies occupying only 5% of board seats (Ionascu et al., 2018). In Sweden, be it in working life or domestic life, women have always been subordinated (Rauhut & Little in Faber, Nielsen & Bennike, 2015). Furthermore, the Sweden study indicated that many women would rather pursue professions that require higher education, whereas men do not pursue such professions but would rather take on manual work – that is nonetheless highly paying – but requires lower educational levels.

Studies show similar trends in Australia, where high incomes related to the Australian mining sector might similarly culminate in more significant inequality, in that, when mining employment increases, the income disparity between women and men also rises (Reeson, Measham & Hosking, 2012). Another Australian study, conducted by Lozeva and Marinova (cited in Stevens, Tait & Varney, 2017) discovered that major problems were related to gender inconsistency and power negotiation, which results in women being marginalised in the mining environment.

The *glass ceiling* is a terminology often used to explain why such a limited number of women reach leadership roles, why in the hierarchical structure of an organisation they are not rising as quickly as men, and why they are likely to face tougher or more unequal promotional requirements than men. Such factors are indicative of an invisible barrier to executive or senior management entry (Stead & Watson, 2006). According to Lorber (cited in Kendall, 2015), this concept suggests that women have the capacity, motivational drive and desire to be employed in leadership roles; yet, men continue to lead high-prestige positions in the Western world. Hill, Corbett and Rose (2010) and Stead and Watson (2010: 120) used the following factors to explain the “*glass ceiling*” phenomenon:

- There is a misconception that promoting women into senior positions could put companies in jeopardy;
- Men in top positions are frequently of the view that women lack the capability, intelligence and skills of men;
- There is a notion that women cannot perform as expected in this threatening sphere;
- Motherhood has a tendency to disturb and derail women from their professions;
- Men tend to feel unsettled by the thought of sharing authority with women;
- Organisational authority stays with males because those in authority endorse those similar to themselves;

- Women lack the suitable attitude, conducts, abilities, education and training for managerial and professional occupations; and
- Organisational and systemic discrimination occur due to structural policies.

Studies show that employment adds to social cohesion by forming values and practices and promoting trust. Value, gender balance and social incorporation are components considered constitutive of social cohesion (Norton & De Haan, 2012). In this instance, gender balance is an end in itself. Moreover, when employment redefines females' tasks in the public eye, they add to a comprehensive feeling of social union. In certain social orders, fundamental blue-collar occupations can remould females' picture and status in society (Norton & De Haan, 2012). In the United States, individuals with preference to female bosses are bound to favour a woman who hold a top position (Newport & Wilke, 2013).

#### **2.4.2 South African perspective on the gender differences in mining senior management positions**

According to Botha (2018) and Botha & Cronjé (2015a, 2015b, 2015c), as well as Zungu (2013), mining in South Africa has always been considered a male space. The last 17 years have seen a change in this male-dominated sector where more women have been given an opportunity to share this space (Minerals Council of South Africa, 2017). Many scholars have, however, found that this growth disguises the unfairness in this sector, which has also been found in other disciplines, such as engineering and law (Martin & Barnard, 2013; McKie & Jyrkinen, 2017; Pinnington & Sandberg, 2014; Sheldon & Wallace, 2013; Wichert & Steele, 2013). South African women in the mining industry continue to experience hurdles to entry and career progression due to unfavourable work conditions (Lahiri-Dutt, 2015; Zungu, 2013).

In South Africa, government policy prohibits discrimination against women, commands equality and supports women. The question of why gender inequalities in the mining industry continue regardless can be answered by concentrating on the unnoticeable hindrances encountered by women in their career journeys. Therefore, this study examines the experiences of female employees in both executive and non-executive mining positions in Anglo American, South Africa, with a look into organisational gender-based issues.

According to Smith, Ali, Bofinger and Collins (2016), mining is an extremely hazardous occupation, but the hazards affect men and women differently. Women experience a

range of weaknesses, such as working in extreme heat while executing work underground, manual handling of heavy equipment and tools because women's physical ability and stature are less than those of men, and they are, then, prone to become more fatigued than men do. This therefore, impedes the successful advancement of women in their mining careers, which would lead to their ultimately holding senior management positions (Botha, 2017; Botha & Cronjé, 2015b).

Other distinctive experiences of women in mining include the domination of males, which makes it infeasible for women to voice their views and the continuous gender inequality that characterises the industry. The career paths of women in all male-dominated professions are weighed down, leading to fewer women enduring and advancing to the organisational ranks (Woolnough & Redshaw, 2016). These difficulties continue, regardless of government policy prohibiting discrimination and supporting women.

## **2.5 GENDER DIFFERENCES IN PERSONAL VALUES**

The belief that organisational positions are not gender-based but asexual disregards gender, the body and sexuality as different elements of the procedures of control and supremacy in companies (Acker, 2012). The feminist scholarship on gender disparities in value orientations indicates that various forms of conduct in men and women are promoted and rewarded through different socialisation.

Women are socialised positively in contrast to the men due to their altruistic behaviour, whereas the men are perceived as autonomous, individualistic and competitive. Altruistic behaviour enables integration of different stakeholders, including communities, employees, suppliers and customers, in considering the shareholders' interests. In a business environment, however, men are perceived to have more leadership experience than women, who are seen to be more experienced in settings such as community and service organisations (Glass, Cook & Ingersoll, 2015).

Women have bodies with the capacity to reproduce offspring and breastfeed, which preclude them from the notion of an ideal employee, unlike male figures with less parental obligation. Motherhood's genuine responsibilities are considered non-work requirements, which adversely affect the requirements of a gender-neutral job (Acker, 2012). The male employee's duty to work at a company is perceived to be greater, and he is required to assume higher-level positions of responsibility and power as opposed to a female employee who has her dedication split in-between work and home or family duties (Banihani, Lewis & Syed 2013).

Male participation and organisational role theories illustrate how gender differences justify the assumption indicating the variance between men and women, and that research ought to be separated accordingly (Acker, 2012). As an illustration, a home is considered the place for women to demonstrate their nursing and caring skills by caring for babies and raising children as they are being viewed as loving and caring (Handy & Rowlands, 2014; Kristensen, Kent, Warming-Rasmussen & Windsor, 2017).

In like manner, the sexual orientation allocation of work finds paid work in organisational settings that are basically different from the setting of most unpaid work, which is in a home environment. The conceptual division of the male (work/public) and female (home/private) fields represents the organisational division between development and reproduction and retains rooted views of manhood and womanhood (Acker, 2012). Public-private duplicated jobs hinder women as they do much of the so-called private work. Many women, however, perform publicly, “pay jobs” during the day, however, take on as *Male participation and organisational role theory* illustrates “second shift” of unpaid childcare and housework upon arrival at home (Blair-Loy, Hochschild, Pugh, Williams & Hartmann, 2015; Kristensen et al., 2017).

It can be argued that women face various challenges and life obligations at different phases; as an example, career and life phases (Sullivan & Mainiero, 2007). Women in the mid-career period face challenges in progressing with their careers due to the salience of women’s views as caretakers, as they are more involved in childcare at that time of their lives (McFaden & Swan, 2012). Whatever their career-life process, most women eventually face obstacles that are not naturally typical among their fellow male equals.

Notwithstanding the increasing numbers of women who keep on joining male-dominated spaces and economic segments, only a smaller amount of women are progressing into the top positions. A host of obstacles hinders the career advancement dreams of women employees, far greater than the obstacles faced by men (Nemoto, 2013; Sheldon & Wallace, 2013; Walsh, 2012; Wichert & Steele, 2013).

Visions of career advancement for women have been defined according to how women are (un)able to combine work and life spheres as single employees (Fernando, Amaratunga & Haigh, 2014; Watts, Frame, Moffett, Van Hein & Hein, 2015). This view is similar to the blaming trend, where victims of crime are considered to be responsible for what happened to them. The empirical studies denote that the misconceptions of workplace mistreatment is aligned with the overall hostile attitudes towards women. The blaming trend thus persists, because the human mind has safeguarded the matter of

self-blame; and women and their sexual orientation have been viewed lightly. Instead of scrutinising victims, the investigators' focus is principally on the (alleged) perpetrators: An investigation will focus on finding as much information as possible about the perpetrator and not on the character, actions, or reputation of the victim (Cortina, Rabelo & Holland, 2018).

Framing inquiries relevant to the advancement of women's careers mask the unusual experiences of women in key mining positions in South Africa (Acker, 2012; Dale & Burrell, 2014).

## **2.6 GENDER DIFFERENCES IN STRENGTHS AND WEAKNESSES**

It tends to be deduced that the foundation of the South African economy remains the mining sector. South Africa is one of the world's and Africa's most indispensable mining nations when it comes to its range and amount of minerals (De Klerk, 2012). It is the premier establishment of almost the entirety of Africa's metals and characteristic assets are fabricated and separated from precious stones (Botswana and the Democratic Republic of Congo [DRC]), uranium (Niger), copper and cobalt (Zambia and the DRC), and phosphates (Morocco) (De Klerk, 2012). Only unrefined oil and bauxite are not produced here. In recent years, with modifications in the government's arrangement and enactment, this condition has gradually started to change.

For over two decades, the South African mining industry has been a vocation-breaking industry, allowing women to participate in mining; however, the qualifying policies and legislations have not been in accordance with job creation initiatives in the sector (Botha, 2017). When compared with other employment sectors, the incorporation of women into mining has been sluggish and, although some change has occurred, women working underground are a significant novelty in South Africa, with their pictures as miners making front-page news. These underground divisions are regularly correlated to perilous workplaces, a generally less exacting environmental strategy and an absence of reasonable mining innovation (Botha, 2017).

Women enter small-scale mining mainly as the last resource for survival. With an underground environment that is dark and wet, including high temperatures relative to the increase in depth, workers are regularly asked to work by themselves in restricted spaces, at times deprived of access to any communication technology (Fourie, 2009). Working conditions are demanding and at times, very dangerous. Wynn (2001) added

that the underground conditions are severe and women must possess a high level of overall fitness. Wynn (2001) suggested the factors to consider are:

- the physical skill to accomplish tasks, for instance, lifting or carrying very heavy items,
- the ability to jerk objects at different inclines or levels on lopsided surfaces,
- an amount of effort required to finish these tasks in limited spaces where the moisture content and temperatures are high.
- these real demanding requirements are to be done day by day for the bulk of the underground move and for long periods.

Wynn (2001) found that females working in the underground activities of a mine performed repetitive tasks; for instance, using high-pressure hoses, conducting samples and bringing them through the plant for processing, and opening vent doors. Wynn (2001) therefore, articulated that women need some level of physical suitability and strength to execute these duties.

Despite the fact that real wellness and good health are certainly an essential in the workplace per the World Health Organization's Healthy Workplace Framework and Model (2010), it is unclear what distinctive apparatus or strategies are called for, to accommodate women. It is likewise notable that, in a mining setting, extraordinary consideration must be paid to security and preparing aptitudes. Schutte, Kielblock, De Villiers and Dias (2002) point out that physiological matters need to be considered, since females are not bodily indistinguishable from males, especially for mining, and the dissimilarities in physiological make-up must be provided for. Thus, it is the organisation's obligation to assess work categories based on their strength requirements.

## **2.7 STRATEGIES TO ENHANCE WOMEN'S PARTICIPATION IN THE WORKPLACE WITH ANGLO AMERICAN AS AN ILLUSTRATIVE CASE**

The strategies included in the ensuing discussion largely apply across South African private sector. Without overstating the case however, the strategies could, to some appreciable degree, apply to South African public sector that has increasingly been adopting managerial models derived from the private sector through New Public Management (NPM) restructuring initiatives. Against the backdrop of this observation, suffice to scaffold the issue of strategies aimed at enhancing women participation in the workplace by observing that South Africa generates more female graduates than males,

and research indicates that South African females have a deep desire to be successful inside the corporate environment. An immense number of females have the confidence and a strong desire to get to the top senior leadership positions, similar to men and, given a chance, they can achieve those statures (Fajardo & Erasmus, 2017). On 1 May 2012, Anglo American made a United Nations Women/United Nations Global Compact commitment to facilitate the empowerment of women (De Beers, 2017 and United Nations, 2018). At that time, 15% of the overall workforce were women (13% in 2009) and 22% of managers were women, (9% in 2006). At board level, the commitment was for Anglo American, at a global level, to increase the representation of women by between 20% and 30% by 2013 (Anglo American, 2012).

Since this study is focused on gender equality in top managerial positions in Anglo American South Africa, the statistics of the group's four South African business units are given in Table 2.2 below to demonstrate the progress in achieving gender equality between 2015 and 2019.

*Table 2.2: Employment equity statistics 2015 vs 2019*

<b>Business Unit</b>	<b>Position</b>	<b>Males: 2015</b>	<b>Percentage Females: 2015</b>	<b>Males: 2019</b>	<b>Percentage Females: 2019</b>
Platinum	Top management	83.3%	16.7%	83.3%	16.7%
	Senior management	90.0%	10.0%	84.5%	15.5%
Coal SA	Top management	87.5%	12.5%	83.3%	16.7%
	Senior management	82.1%	17.9%	80.2%	19.8%
Kumba Iron Ore	Top management	70.0%	30.0%	58.3%	41.7%
	Senior management	77.9%	22.1%	78.4%	21.6%
De Beers	Top management	77.8%	22.2%	58.3%	41.7%
	Senior management	83.9%	16.1%	72.8%	27.2%
<b>Overall statistics</b>		<b>85.5%</b>	<b>14.5%</b>	<b>78.9%</b>	<b>21.1%</b>

Source: Anglo American South Africa, Employment Equity monthly report (December 2015 & June 2019).

Table 2.2 above points out the progress made over a period of five years. The overall statistics for women were 14.5% in 2015 and 21.1% in 2019. The progress is slow but steady. However, for South Africa, as a country where 51.2% of the population is female, of whom 45% are economically active; the figure of 21.1% is unsatisfactory (Bosch, Van der Linde & Barit, 2020). There are potential reasons that indicate invisible barriers, such as corporate practices relating to career development opportunities within corporates, that prevent women from progressing (Oakley, 2000). According to Botha (2016), there are more factors that pose challenges for women, resulting in the low numbers of women in the mining industry, which are listed as follows:

- a working culture that is dominated by males;
- female miners' being perceived by miner's wives to be sexual and economic threats;
- insufficient professional career development;
- masculine dominance used by men in the workplace, resulting in the use of sexual harassment;
- refusal by male employees to train female employees or to allow them to receive training, thereby undermining females;
- senior management's lack of commitment to diversity.
- shift work challenges;
- the jealousy of the husbands of women miners;
- the lack of flexible working arrangement and difficulty of work-life balance;
- the lack of role models and mentors in senior positions; and
- women's capabilities being misconceived.

These sentiments are, however, contrary to those of Anglo American, which is a mining company that firmly believes in transformation and views it in a broader context of "going beyond compliance" (Anglo American Transformation Report, 2018). Anglo American as a group achieved an increase in the statistics by employing various initiatives. Some of the initiatives employed at group level and at various operations are bursaries, internships and learnerships, the Achiever Programme, the Programme for Management Excellence, the Leaders in Anglo American programme, and the Building Leaders and Shaping Talent programme (Anglo American Transformation Report, 2018).

Other interventions fall within the field of diversity and inclusion, such as the Living with Dignity programme aimed at eliminating gender stereotypes. Men as Partners is an initiative under the Living with Dignity programme, and seeks to foster the engagement of men to encourage social change, to become positive role models in their communities, and to support women and children. The initiatives are also designed to address gender-based violence through the implementation of interventions to facilitate non-violent dispute resolution, constructive parenting and gender de-stereotyping for families and employees. Some of the programmes undertaken by Anglo American include the following:

- training about sexual harassment: This is intended to promote changes in perceptions and behaviour among the workforce;
- providing personal protective equipment (PPE) suitable for women: PPE that accommodates the female physique; and
- including women in mining forums: aimed at ensuring women's specific needs are noted and addressed.

## **2.8 CONCLUSION**

It is clear from the literature that there is still more work to be done in combating gender inequality in the mining sector. The Mining Charter is still not adhered to, leaving women less room to explore their potential in senior management and leadership positions in the mining sector because they are still being observed with a traditional eye that restricts them from sharing powers with men. Women are still considered less capable than their male counterparts, with less provision of upskilling to allow them to sail smoothly into male-dominated executive positions, ultimately contributing negatively to their careers. The quandary of gendered discrimination generally, and the opportunities of women for career advancement in the mining sector of South Africa specifically, is aptly summarised by the insights of Moalusi and Jones (2019), who document that, even with a phenomenal increase in the number of women working in the mining industry, the statistics conceal several gender disparities because the gendered barriers relating to the career advancement continues, in spite of the remarkable equity policy regime that exists in South Africa. It is, however unclear, how their career is encumbered from the viewpoint of women themselves (Moalusi and Jones, 2019: 1)

The latter insight only serves to highlight the complexities attendant on unravelling the persistent gendered inequities in South Africa's mining sector. Moalusi and Jones

(2019) attempted to provide some answers to these complexities through their main findings, which included:

- i. pervasive male dominance has oppressed and pressured women to imitate masculinity, which has legitimised established gender barriers;
- ii. the long, awkward and random working hours have deepened the time constraints of women because they must balance the role of home or family caretaker with work; and
- iii. due to a combination of the above two factors, managerial processes in these organisations are not gender-neutral and asexual, so there is a possibility of women being affected adversely in comparison to men.

The above insights may apply, by and large, to lower cadres of the human resource complement in a South African mining operation. However, as the finding of this study demonstrates, they apply equally to senior management positions in South Africa's mining companies, where gender parity is still below par, according to projections laid down by various legislative, policy and regulatory instruments.

## **CHAPTER 3**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter presents the rationale for the research design and methodology of the study. At the outset, it is important to point out that the “research design” answers the question: “What kind of study?” whereas the “research methodology” answers the question: “How was the study done?” Specifically, the chapter outlines the details of the research design, including aspects such as the nature of a cross-sectional survey design that adopted quantitative and qualitative approaches and the epistemological underpinnings of the research design with a particular concentration on the transformative paradigm; and the aspects of research methodology, including sampling, data collection and ethical considerations.

#### **3.2 RESEARCH DESIGN**

The study employed a cross-sectional survey design that combined quantitative and qualitative approaches. In general, a *cross-sectional study* is defined as a form of observational analysis that scrutinises data gathered across a sample population or a pre-defined subset at a given point in time. According to research website ‘QuestionPro’, this type of study is often known as a cross-sectional analysis, a transverse study, or a prevalence study, and it is frequently used by researchers to explain findings in physical and social sciences and many business sectors.

Cross-sectional studies are conducted at one stage or over a short time, according to Levin (2006: 24). Typically, they are carried out to estimate the prevalence of the outcome of interest for a given population. Data collection can be in individual characteristics or group dynamics and individual and/or collective outcomes. In this way, cross-sectional studies include, at a particular point in time, a "snapshot" of the result and the features associated with it. The design of a cross-sectional sample is used when:

- the goal of the analysis, mostly in the form of a survey, is descriptive. There is typically no hypothesis as such, but the purpose is to characterise a population or a subgroup with regard to an outcome and a collection of risk factors within the population; or

- the aim of the analysis is to establish the prevalence of the outcome of interest at a given time for the population or subgroups within the population.

These definitions find corroboration in Zheng, Zhu, Zhao and Zhang (2015: 67) who document that cross-sectional research is a research method in which researchers, at a certain point in time, examine the state of affairs in a population. In practice, instead of using a survey or a full enumeration to gather data on the target population, researchers collect data on only a small portion of the population in order to obtain information on the sampled elements of the population as a whole. Very often, to draw inferences about the population as a whole, the elements in the sample survey are chosen randomly. Therefore, in cross-sectional analysis, sample surveys for different fields are widely used by researchers.

Using a cross-sectional survey design enables data to be gathered at a single point in time by drawing inferences about a population of interest (top management) (Lavrakas, 2008). The statistical analysis used included a descriptive frequency analysis in determining characteristics among respondents. Additionally, a *t*-test was run to compare the variables of interest among males and females. Qualitative data was analysed through content analysis. It was imperative to include qualitative analysis in a cross-sectional survey design that includes substantial/deep literature review because for all the worth of quantitative analysis, it is not practical nor logical to analyse literature through quantitative methods. Content analysis skewed towards thematic analysis is always a better approach and method. The study adopted this approach.

### **3.2.1 Epistemological considerations**

Inspiration for the transformative paradigm is based on a solid social justice and human rights plan that is specifically focused on marginalised societies, which include women. The transformative paradigm in research falls within the broader epistemological ambit of critical realism and how critical realism is related to the endeavour of knowledge generation.

Egbo (2005: 271) crystallises this observation by documenting that critical realism lies on the premise that the accounts of research participants (in this case, the respondents in the study) are objective social science evidence that can lead to consequential social change if properly interpreted (in this case, a review of equity policies targeting females in top and senior management positions at Anglo American and concomitant redress

actions). The positive social transformation under this arrangement, starts with policies that consider social actors' opinions, values, and intentions as expressed in their own accounts.

In addition, the analysis of agent reports (in this case, the respondents in the study) is not an end in itself, but rather a starting point for transformative action according to the critical realist theory. From this perspective, the resultant emancipatory knowledge coming from research conducted within the transformative paradigm should lead, to the transformation of unwanted practices into more beneficial ones. Implicitly, the moral compulsion of researchers operating within this paradigm is to use the results of their context-based investigations to alter the social world in such a way as to bridge the difference between their research and lived realities.

To augment the preceding observations, Egbo (2005: 275) documents that, with regard to research, the main propositions of critical realism (which is the epistemological scaffolding of the transformative paradigm in research) comprise of the following:

- the reasons and accounts of study participants constitute reliable empirical evidence and, when such findings are made available for consultation, the world views of people and the non-human institutions that produce dominant systemic forces in their lives become clear.
- people's accounts and motives often show what they feel about such world views due to the humanly capacity for reflexive self-monitoring.
- researchers are morally pressured to use information from the data to substitute unwanted social processes with more required ones while exposing oppressive social systems.
- the aim of social science inquiry should be liberation (resulting from critical consciousness).
- only if the processes that affect people's lives can be recognised and understood, then the social environment's transformation can occur.

As Mertens (2009) clarifies, the transformative paradigm developed because of people who have been pushed to the cultural edges from the beginning of time, with the intention of carrying their voices into the universe of research. All things considered, this methodology straightforwardly connects with the analyst or evaluator in working comprehensively with society to contest the status quo and examine areas of intensity and benefit, as a method for encouraging social justice and human rights in the end.

This world view fits this examination through the hypothesis that various culture and gender-related factors exist, which may impact or advance women's career progression in the mining industry. The transformative world view can be utilised when endeavouring to comprehend circumstances that are normally seen as difficult (Mertens, 2009).

Mertens (2009) examines regular subjects in the transformative worldview as (i) moral positions of consideration and contesting mistreatment, (ii) societies that construct a relationship where techniques are open and unmistakably comprehended, and (iii) dispersal of discoveries in ways meant to advance social equity, social change and human rights. Mertens (2007) clarifies that, in the transformative world view, authority issues must be addressed during each progression of the exploration procedure. Currently, these challenges are addressed through the selected approach, which is quantitative data collection and analysis. This guarantees that the outcomes of the research mirror the respondents' perspectives and reality, and not the researcher's translations of their reality.

Writing a little later, Mertens (2012: 3) further clarifies that the transformative paradigm is a meta-physical construct that explicitly includes the difficulty faced in culturally diverse societies by researchers and evaluators as their work focuses on increasing social justice. It focuses on the conflicts that occur when a research background that discusses intransigent social issues permeates unequal power relationships.

The issue of gender disparity in top and senior management positions at a leading global mining company like Anglo American fits into the framework of research issues that would readily be interrogated through the transformative paradigm. But this is not all: Mertens (2012: 3) provides an insightful view of the transformative paradigm by recording that the model focuses on the strengths of groups that face segregation on the basis of their cultural values and experiences. "Strengths" like these were discovered in the females in the sample.

Overall, the paradigm was selected for the study because the "transformative world view" is an umbrella term that incorporates women's activist methodologies, just as studies with marginalised societies (Creswell, 2009).

### **3.3 RESEARCH METHODOLOGY**

The study deployed secondary and primary data collection methodologies. The details of each of these methodologies are outlined in the following subsections.

### **3.3.1 Secondary data collection**

Secondary data collection entails the following:

- i. deep academic literature review, and
- ii. review of policy documents, resolutions and operations manuals.

These processes are elaborated on briefly in the following sections.

#### **3.3.1.1 Deep academic review**

An in-depth academic review of the literature is a deliberative process in which themes that relate to the research topic, aim and objectives of the study, as well as the research problem and research questions, are collated and categorised. It was one of the research methods that were deployed in the research reported in this dissertation.

This deliberative process, in line with Bell (2005: 100), sought to provide the researcher with a nuanced overview of the state of women empowerment and related issues, such as career progression, especially within the managerial echelons in the mining sector in South Africa, while updating [the researcher] with previous research in the area, pointing to general agreements and disagreements (Babbie and Mouton 2009: 565). Effectively, the main aim of the deep literature review was to put into perspective the research study, to decide what previous scholars have written on this subject and to recognise the main models and hypotheses that are important to the research study (Howard 2014: 101).

In summary, the literature review tried to satisfy the "why perform a literature review" criteria that is articulately endorsed by Zorn and Campbell (2006: 173), who declared that firstly, in the university setting, literature reviews are also critical for scholarly study. They can be a source of ideas, questions for study, and hunches to explore. That is, we can recognise possibilities for potential study by seeking examples of well-executed research, interesting ideas that are not especially well executed, or holes in the body of knowledge in a discipline. Reviews of literature also help scholars stop "reinventing the wheel" by encouraging them to draw on what others have done. Finally, literature reviews help researchers create a case for their study by showing that they are expanding current knowledge-building on what is already out there and filling existing gaps.

The literature review carried out for the study reported in this dissertation satisfied all the above parameters.

### **3.3.1.2 Review of policy documents/resolutions/operations manuals**

The second phase of secondary data collection entailed a review of policy documents, resolutions and operations manuals, including the Constitution of the Republic of South Africa, 1996, legislation and policies governing South Africa's mining industry, and Anglo American's in-house policy documents, resolutions and operations manuals. As was the case with the academic literature, the review of policy documents, resolutions and operations manuals was a deliberative process in which themes that related to the research topic, aim and objectives of the study, as well as the research problem and research questions were collated and categorised.

### **3.3.2 Primary data collection**

The study also involved primary data collection. The specifics of primary data collection are outlined in the following subsections.

#### **3.3.2.1 Study population**

According to Babbie and Mouton (2009: 173) a population is "the theoretically outlined combination of the study elements". The study was anchored in four main business units (i.e., Platinum, Coal SA, Kumba Iron Ore and De Beers) within Anglo American South Africa mining. It targeted top and senior managers in these four business units. As per the description in the Anglo American global banding framework, people in top management position are ultimately accountable for an Anglo American division, or leading a group function. This means that the people in top management position set the highest level of business strategy for the group or business unit. These top and senior managers were the study population, which is defined by Babbie and Mouton (2009: 174) as that "aggregation of elements from which the sample is actually selected".

Senior managers are defined as people who lead either a major function within a division or part of a group function. Typically, a member of the executive management team of the division or group function leads a significant operational unit (e.g., a mine) or a business within a division, or provides division-wide or group thought leadership and advice upon which key strategic decisions are taken, or leads a large operation or professional team, or provides high-level technical or professional advice. They are also experienced professionals who contribute through a significant management role or applying expertise. Based on the June 2019 report by Anglo American South Africa,

there are 415 males occupying top and senior positions in the aforementioned business units, and 111 females occupy similar positions.

### 3.3.2.2 Sample

Given that the population size of the top and senior management position occupants in the four main business units of Anglo American South Africa was 526, the researcher conducted a census with the two profiles: males and females. The sample size was determined by considering the low rates of top management positions in the company; therefore, the study included males and females in top and senior management positions surveyed from the four business units. The total population served as the sample size. Conducting a census allowed for the natural fall of population and catered for the possibilities of a low hit rate of responses or non-submission of the questionnaires.

To select top and senior managers within the organisation, a stratified random sampling technique was utilised. The strata were further categorised by gender. In stratified sampling “the population is partitioned into groups, called strata, and sampling is performed separately within each stratum” (Ahmed, 2009: 3).

Table 3.1 below depicts the sample breakdown of the achieved sample.

*Table 3.1: Total sample size of employees in top and senior management positions*

<b>Unit</b>	<b>Position</b>	<b>Male</b>	<b>Female</b>
Platinum	Top management	10	2
	Senior management	142	26
Coal SA	Top management	5	1
	Senior management	93	23
Kumba Iron Ore	Top management	7	5
	Senior management	76	21
De Beers	Top management	7	5
	Senior management	75	28

Unit	Position	Male	Female
<b>Total</b>		<b>415</b>	<b>111</b>

### 3.4 DATA COLLECTION METHOD

#### 3.4.1 Instrument

*Questionnaires* are described as instruments that present the same set of questions or statements to all participants, to which the participants then respond by providing written responses, making Likert-style decisions, or choosing options from a series of statements. Questionnaires were used in the research, together with a data elicitation tool widely used in public administration and management research. The questionnaire's biographical data questions and structure followed the general questionnaire format outlined by Babbie and Mouton (2009: 239–244).

A key factor in opting for questionnaires was *efficiency* in the context outlined by Rahman (2017), which means that they can easily be administered to a large number of participants, they can be objectively scored, and the data can be quantitatively analysed. In line with this observation, the data from the questionnaires was analysed quantitatively.

The questionnaire was adapted from a study, titled "The perceptions of the work environment of women in core mining activities" conducted by De Klerk (2012), which had five sections. Section 1: Biographical data (5 questions); Section 2: Qualifications and experiences (4 questions); Section 3: Perception of women in mining (7 questions); Section 4: Career advancement (5 questions) and Section 5: Challenges experienced by women in mining (5 questions). The responses were based on a 4-point Likert-type scale rating (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree).

#### 3.4.2 Procedure

Taking advantage of the availability of technology and the fact that the majority of respondents were top and senior managers well versed in technology, this study utilised an internet-based platform for data collection. Respondents received a secured link directing them to a self-completion survey platform. The advantage of this approach is that it is quicker.

Prior to that, the Human Resources division was requested to sensitise their top and senior management colleagues to the research and to ask them to volunteer to participate in the survey. Interested volunteers confirmed participation through the link on the e-mail. The respondents were redirected to the questionnaire which contained the informed consent form at the front of it. The Human Resources division thus acted as gatekeeper.

All the details of the study were outlined in the introductory letter. Respondents were given a timeline of a week to complete the survey.

### **3.5 DATA ANALYSIS**

Data analysis was through two approaches or methods:

- i. Qualitative data analysis
- ii. Quantitative data analysis

These two approaches are elaborated upon in the following subsections.

#### **3.5.1 Qualitative data analysis**

Qualitative data analysis was exclusively through content analysis. Several definitions of content analysis are available in the literature. Prasad (2008: 174-175) offers a summary of these, recording that broad content analysis can be seen as a methodology in which the content of the message forms the basis for drawing inferences and conclusions regarding the content analysis. A detailed review of the process concepts reveals an emphasis on issues such as system, objectivity, quantification, meaning and validity, with regard to the conclusions drawn from the content of communication regarding the sender, the message or the recipient of the message. Thus, on the basis of clear rules, content analysis is all about making true, replicable and objective inferences about the message. In addition, content analysis conforms[to] three fundamental principles of the scientific method[which] are, like any other research method: objectivity, systematic, and generalizability.

Specifically, the research reported in the article undertook a qualitative content analysis of literature.

According to Hsieh and Shannon (2005: 1285, citing Kaid 1989), all qualitative content analysis approaches involve a similar analytical framework of seven classic stages, including formulating the study questions to be answered, selecting the sample to be

evaluated, defining the categories to be applied, outlining the coding process and coder training, implementing the coding process, deciding the sample to be analysed, defining the categories to be applied, outlining the coding process and coder training, implementing the coding process, All seven measures were carefully and diligently executed by content analysis carried out on data analysed in this report. Content analysis carried out on data analysed in this study carefully and faithfully executed all the seven steps.

### **3.5.2 Quantitative data analysis**

Quantitative data analysis was through descriptive and inferential statistics. According to Phakiti (2010: 43–44) “an average score is an example of the use of a descriptive statistic to describe a data set. *Descriptive statistics* can be divided into measures of frequency, central tendency and dispersion” whereas “*inferential statistics* are used to help us look beyond raw data and descriptive statistics. They help us make inferences about population parameters (e.g., a relationship between two variables or group differences in a variable of interest)”.

Quantitative data was analysed using the statistical package R (R Core Team, 2020). The first and second objectives were achieved through frequency analysis. Firstly, a descriptive analysis was conducted to describe the characteristics of participants and determine their personal values. Data analysis gave rise to the conclusion of gender equality. A *t*-test analysis was further used to determine mean-value comparisons.

### **3.6 ETHICAL CONSIDERATIONS**

Ethical issues have become central to the process of study in recent years. Ethics is a matter of integrity on a personal level, in the words of Louw (2014: 262-263), but its ramifications extend well beyond the individual. A researcher who acts with integrity adheres to ethical principles and professional standards that are appropriate, even in the face of adversity, to conduct science in a responsible way. Specifically, ethics are important in science since they potentially impact all research stakeholders. According to Discroll and Brizee (2010), the gathering of information from individuals continually raises moral concerns.

The researcher works for the Anglo American business unit, De Beers, which gave rise to a potential conflict of interest. However, this was mitigated by Human Resources' acting as a gatekeeper. It is also important to declare that the researcher did not have

any vested pecuniary interest in conducting the research. Other moral issues were managed in ways outlined in the following subsections:

### **3.6.1 Obtaining of permission**

Permission to perform the research was sought and received from Anglo American's senior management. A fundamental consideration in obtaining this permission was to ensure that the study did not breach the Anglo American Code of Conduct (the employer of the researcher) and any contractual limitations on disclosures that might require Anglo American employees to discuss certain aspects of the business. In this way, for both herself and her colleagues, the researcher maintained adherence to the employer's code of conduct. As a demonstration of this, the Human Resources division of Anglo American distributed the questionnaires.

### **3.6.2 Informed consent**

Louw (2014: 264) points out that in a research study, participants should know that they are taking part. They should be told about this formally and should give their consent. During their participation, they should understand what will be asked of them, whether and how their identity will be covered, and how the findings will be used. This information should ideally be specified in writing and participants should sign their consent and maintain records of the details thereof. The research reported in this study diligently adhered to these standards of informed consent. Mining authority consent and approval from respondents were obtained (Annexure A and Annexure B).

The questionnaire was completed in English – the language adjudged as a lingua franca for Anglo American employees (especially at management levels) – and thus not disadvantageous to any participant in the study.

### **3.6.3 Confidentiality**

When researchers maintain confidentiality for participants, it implies that while [researchers] will be able to match the identities of the participants to their research answers, facts will only be known to the researcher and will not be made accessible to anyone else (Louw 2014: 267-268). During the analysis, the researcher carefully applied this confidentiality standard. All reports have been handled confidentially. There were no names written on the questionnaires. After six months, all data will be destroyed. Participants were not connected to the data.

### **3.6.4 Voluntary participation**

None of the respondents was forced or compelled to take part in the study. They all participated voluntarily and willingly in the research. To a certain extent, the topic under investigation contributed to heightened interest in participating in the study because issues of equity are part of the declared institutional culture at Anglo American. This interest contributed much to ensuring voluntary participation. However, respondents had the right to withdraw from the study, as well as the right not to participate.

### **3.7 CONCLUSION**

The chapter clearly outlines the research methodology used in the study. The research methodology, i.e., the research design and the research methods outlined in the foregoing sections adequately addressed the research problem and the objectives of the study. The extent to which this was achieved is reported in the next chapter, in which the findings of the study are presented, mainly in the form of charts and graphs.

## **CHAPTER 4**

### **DATA ANALYSIS**

#### **4.1 INTRODUCTION**

The results of the study are presented below with all the elements relating to the primary objective of the study, to develop a framework to reduce the gender differences within Anglo American. The study was anchored on two secondary research objectives: the first objective was to explore the causes of the gender differences relating to why women do not progress to senior leadership positions; the second objective was to identify the gender-different challenges faced by the occupants of top and senior management positions in a South African mining company.

#### **4.2 RESPONSE RATE**

A census was conducted among both males and females occupying top and senior management positions within the four South African business units of the Anglo American mining company (Platinum, Coal SA, Kumba Iron Ore and De Beers).

The 30 June 2019 employment equity figures for the top and senior positions in Anglo American South Africa business units were stated as 526. Information regarding 503 of these employees was provided by the respective business units at the data collection stage. Questionnaires were e-mailed to 503 employees occupying the positions of interest but only 269 completed the survey.

It should be noted that rows were dropped from all analyses entirely and not even counted, where respondents picked 'No' to consent. Additionally, rows were dropped where respondents failed to explicitly select 'Yes' on all consent questions, even though those individuals sometimes continued to participate in the survey. Consequently, the data analysed was based on 248 questionnaires, that is, 49% coverage, based on the 503 questionnaires sent out.

Dr Sean van der Merwe from the University of the Free State Statistical Consultation Unit produced the statistical analysis, figures and tables (refer to Annexure C).

#### **4.3 ANALYSIS AND INTERPRETATION OF BIOGRAPHICAL DATA**

The purpose of the initial collection of demographic information in the questionnaires was to provide a profile of the respondents. A statistical analysis of the respondents'

demographic profiles was performed and the tabulation thereof is discussed below in Table 4.1. While the employee statistics among the top and senior management at Anglo American indicate that there are more males than females occupying such positions, similar to the data collected, there were more male respondents (71%), with only 29% accounting for female respondents. Almost half of the respondents (44%) are white, followed by just over a quarter (37%) who are Africans. A small percentage (3%) are foreign nationals.

The majority of the respondents (82%) are in a marriage commitment, followed by 7% who are single and 3% who are divorced. Over a quarter (38%) of the respondents have only two children, followed by 21% who have three children. Only 13% do not have children.

In terms of educational attainment, the majority (65%) of the respondents hold a postgraduate degree, while 32% stopped at a degree qualification. Only 2% were satisfied with Grade 12.

The majority (98%) of the respondents are in senior management positions and 85% have been with the company for over ten years. Statistical comparisons between the top and senior managers were not possible as too few top management responses were obtained; therefore, the remainder of the findings concern top and senior managers as a single category, with the focus almost entirely on senior managers. Over a third (36%) of respondents acquired their skills through formal education, while a quarter (26%) of them moved through the ranks, followed by an equal split of 14% between respondents reported having acquired their skills through aptitude and ability and those who received on-the-job training.

*Table 4.1: Demographic characteristics of the sample of top and senior managers at Anglo American Mining (South Africa) N=248*

<b>Sample Demographics</b>		<b>n</b>	<b>%</b>
Gender	Male	175	71%
	Female	72	29%
	Gender non-confirming	1	0%
Demographic	African	90	37%

	Coloured	12	5%
	Indian	26	11%
	White	108	44%
	Foreign National	8	3%
	Other	1	0%
Marital status	Single	16	7%
	In a relationship	13	5%
	Married	202	82%
	Divorced	8	3%
	Other	6	2%
Number of children	0	32	13%
	1	38	15%
	2	93	38%
	3	51	21%
	4 and above	32	13%
Highest educational qualification	Below Grade 12	0	0%
	Grade 12	4	2%
	Degree/Diploma	80	32%
	Postgraduate degree	161	65%
	Other	4	1%

Current role	Top management (Board Member, Registered Director)	6	2%
	Senior management (GBF 3,4,5)	241	98%
Years of experience in mining industry	< 1 year	2	1%
	1-2 years	5	2%
	3-5 years	8	3%
	6-10 years	22	9%
	>10 years	209	85%
How skills in mining were acquired	Risen through the ranks	64	26%
	Internal promotion	17	7%
	Formal education	89	36%
	On-the-job-training	35	14%
	Self-study	8	3%
	Aptitude and ability	36	14%
Age	18-20 yrs	0	0%
	21-30 yrs	0	0%
	31-40 yrs	59	24%
	41-50 yrs	113	46%
	51-60 yrs	76	31%

The majority of the respondents fall in the elderly age categories wherein almost half (46%) reported to be in the 41–50 age group, followed by 31% who are aged between 51 and 60. It could therefore be deduced that senior management positions in Anglo American mining are mainly occupied by male individuals in the older age category with

over ten years' work experience. This highlights the gender inequality in the company's top and senior management positions.

#### **4.4 ANALYSIS AND INTERPRETATION OF QUESTIONNAIRE**

This section addresses the various measurements of respondents' perceptions of women in mining, their career advancement and challenges.

Data gathered through the questionnaire were subjected to frequency counts. In other words, the respondents' answers for each individual question were added together to find the highest frequency of occurrence (i.e., the number of times that a particular response occurred).

The quantified responses to the questions are presented as percentages in bar graphs, which are summarised below with congenic reliability outcomes first.

##### **4.4.1 Reliability**

The purpose of this section is to assess the degree to which the same factor is evaluated by separate sets of statements. The researcher sought to find an underlying factor that explains the responses to a set of statements as a whole; that is, focused on factor analysis. Reliability measures lower than 0.7 indicate that various definitions are being measured; while measures above 0.95 indicate that the same statement is being presented in different terms. A value in the target range of 0.7 to 0.95 is required to quantify a single definition accurately.

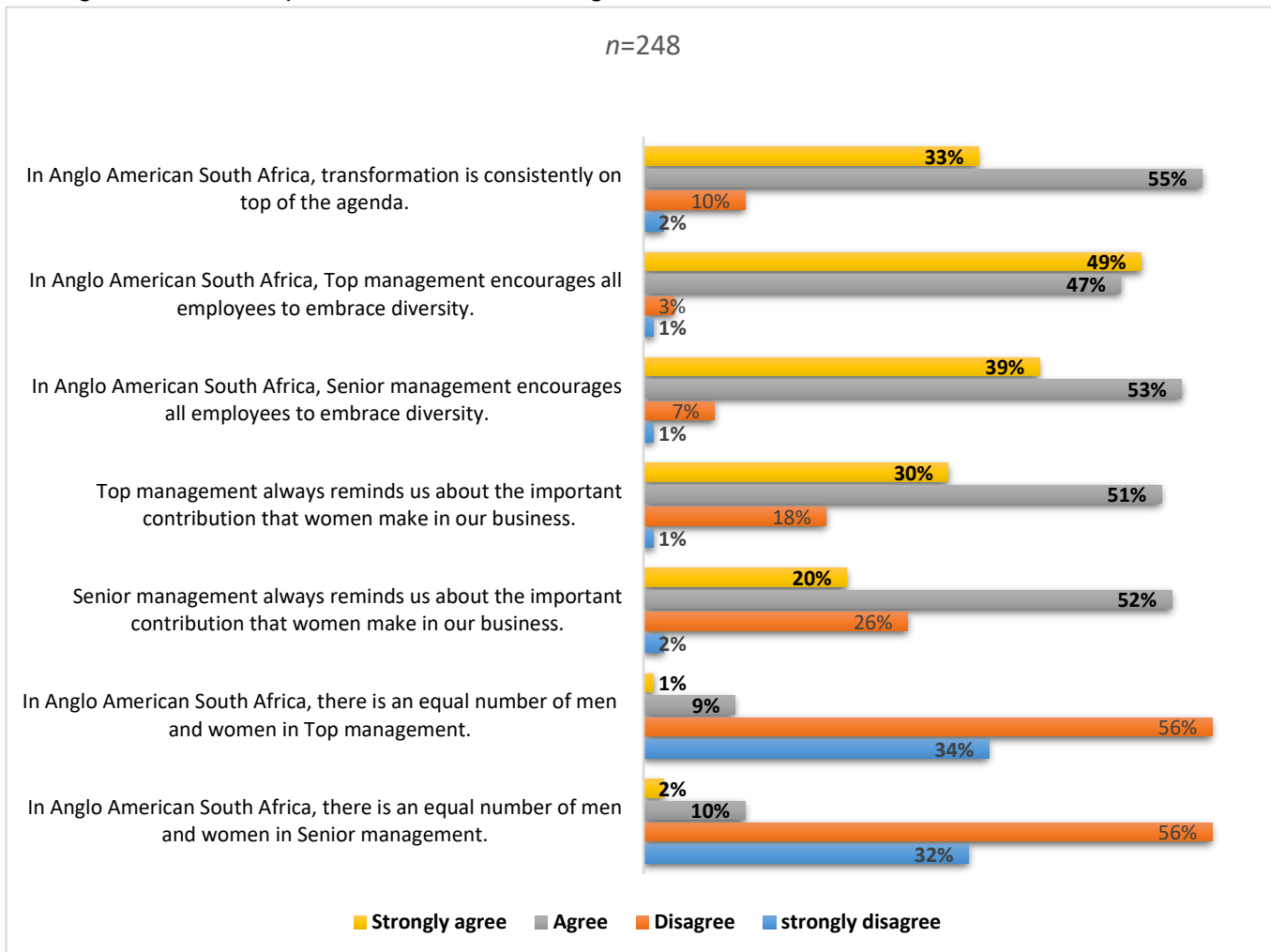
Reliability tests include presenting all statements in the same direction. Only Statement 6.5 was flipped around numerically for this study ("In Anglo American South Africa, women are either harassed, bullied or victimised").

In this survey, the reliability of three sets of statements was evaluated:

- Perception of women in mining – a reliability factor of 0.84 is provided by comparing responses.
- Career advancement – the comparison of responses produces a reliability factor of 0.8.
- Challenges experienced by women in mining – a reliability factor of 0.72 is provided by comparing responses.

#### 4.4.2 Objective 1: Gender differences relating to why women do not progress to senior leadership positions

Figure 4.1: Perceptions of women in mining



The findings show that, in combination, 88% of employees are in agreement that transformation is consistently on top of the agenda at Anglo American, while only 12% do not share the sentiment. The majority (49% and 47%) of the respondents further reported that the company's top management encourages its employees to embrace diversity. While similar sentiments are shared about senior management, over half (53%) of the respondents only agree with the statement, while 39% strongly agree. Only 8% (combined) do not agree with the statement about their senior management.

Furthermore, 51% agreed that their top management always reminds them of the important contribution that women make in the company, with a similar percentage (52%) holding the same view about their senior management.

It is noteworthy that the gender inequality in the company's top and senior management positions was confirmed by the combined total of 90% and 88% of employees

respectively, who disagreed that there were equal numbers of women and men occupying these positions.

A *t*-test analysis was conducted to compare the mean (average) with the value that would be expected if nobody had an opinion and just answered the question at random (NullExp). The *p*-value is roughly the probability of seeing a difference as large as or larger than what is seen, under the assumption that the values actually are the same in the population.

The *t*-test in Table 4.2 below shows the differences between male and female perceptions of top and senior management attitudes to women in the mining industry.

*Table 4.2: t-test showing means, standard deviations and significant differences between male and female perceptions of women in the mining industry*

<b>Variables</b>	<b>n</b>	<b>Mean</b>	<b>Std.Dev</b>	<b>Female</b>	<b>Male</b>	<b>Sig.</b>
In Anglo American South Africa, transformation is consistently on top of the agenda.	250	3.200	0.677	3.014	3.280	0.010**
In Anglo American South Africa, top management encourages all employees to embrace diversity.	250	3.432	0.619	3.306	3.486	0.044*
In Anglo American South Africa, senior management encourages all employees to embrace diversity.	250	3.308	0.631	3.222	3.343	ns
Top management always reminds us about the important contribution that women make in our business.	248	3.105	0.712	2.806	3.231	0.000***

<b>Variables</b>	<b>n</b>	<b>Mean</b>	<b>Std.Dev</b>	<b>Female</b>	<b>Male</b>	<b>Sig.</b>
Senior management always reminds us about the important contribution that women make in our business.	250	2.912	0.734	2.667	3.017	0.000***
In Anglo American South Africa, there is an equal number of men and women in top management.	248	1.778	0.658	1.556	1.867	0.000***
In Anglo American South Africa, there is an equal number of men and women in senior management.	249	1.815	0.682	1.597	1.897	0.000***

\* 0.05

\*\*  $p < 0.01$

\*\*\*  $p < 0.001$

Results in Table 4.2 above show that there was a strong significance for the following: (i) Top management always reminds the female employees about the important contribution that women make in the business,  $M = 3.105$ ,  $p < 0.001$ , with males scoring higher than females (X-bar 3.231 vs X-bar 2.806); (ii) Senior management always reminds the female employees about the important contribution that women make in the business,  $M = 2.912$ ,  $p < 0.001$ , with males scoring higher than females (X-bar 3.017 vs X-bar 2.667); (iii) In Anglo American South Africa, there is an equal number of men and women in top management,  $M = 1.778$ ,  $p < 0.001$ , with males scoring higher than females (X-bar 1.867 vs X-bar 1.556); and (iv) In Anglo American South Africa, there is an equal number of men and women in senior management,  $M = 1.815$ ,  $p < 0.001$ , with males scoring higher than females ( X-bar 1.897 vs X-bar 1.597).

There were significant differences in the following two variables: In Anglo American South Africa, transformation is consistently on top of the agenda,  $M = 3.200$ ,  $p < 0.01$ , with males scoring higher than females (X-bar 3.280 vs X-bar 3.014); and “Top management encourages all employees to embrace diversity”,  $M = 3.432$ ,  $p < 0.05$ , with males scoring higher than females (X-bar 3.486 vs X-bar 3.306).

There was no significant difference in opinions about whether senior management encourages all employees to embrace diversity.

Figure 4.2 below addresses career advancement for women in mining.

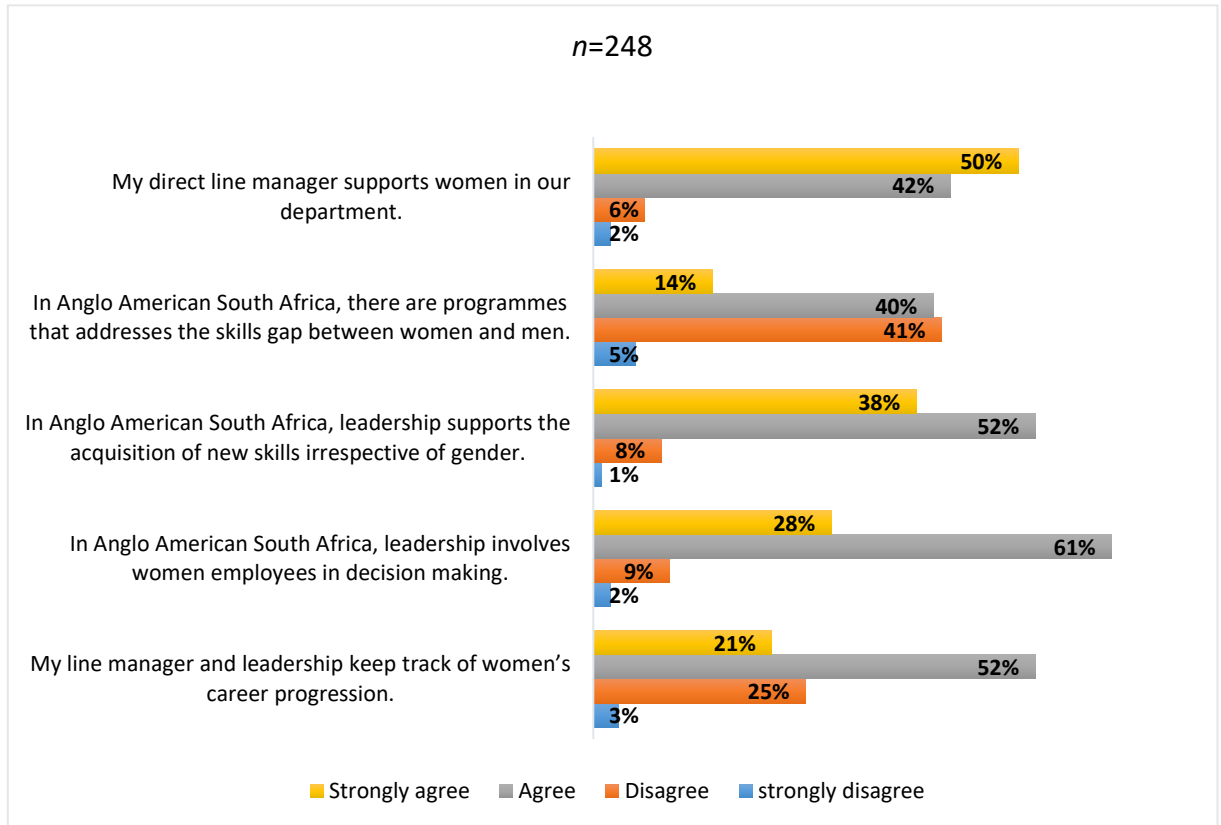


Figure 4.2: Career advancement for women in mining

According to Figure 4.2 above, in addressing issues of women advancing career-wise at Anglo American mining, 50% strongly agree that their line managers support women in their departments, followed by 42% who also agree with the statement. Effectively, a combined 92% of respondents were in agreement that direct line managers do support women in their departments.

While women are reportedly being supported, 41% of the respondents indicated a gap in the support structure because they disagreed about the existence of programmes that address the skills gap between women and men, while 5% strongly disagreed. Conversely, 40% of the respondents agreed that these programmes exist, followed by 14% who strongly agreed with the statement. Of importance is the fact that it was the females who mostly disagreed that such programmes exist (Figure 4.2: X-bar 2.743 vs X-bar 2.343).

Furthermore, over half of the respondents (52%), followed by 38%, indicated that their leadership supports the acquisition of new skills, irrespective of gender. Only a total of 9% gave negative responses in this regard.

It is clear that the inclusion of women in decision-making is also considered an aspect in the company's leadership, as reported by majorities of 61% and 28%. However, a total of 11% indicated that they disagreed with the statement.

Lastly, it is worth noting the opinions that line managers keep track of women's career progression: 52% agreed and 21% strongly agreed, whereas 28% took the opposite view of this matter.

Whatever the case, what arises is that women should be progressing well, career-wise. There should, therefore, be an investigation of whether they actually are progressing well or whether there are hindrances that prohibit them from progressing to top or senior management positions. If they are not progressing well, measures must be put in place to rectify the situation. There should be clearer indicators of what women progressing to these positions have to be cognisant of.

Table 4.3 below shows the similarities and differences between male and female views of the provisions for women's career advancement at Anglo American South Africa.

*Table 4.3: t-test showing means, standard deviations and significant differences between male and female opinions of women's career advancement at Anglo American South Africa*

<b>Variable</b>	<b>n</b>	<b>Mean</b>	<b>Std.Dev</b>	<b>Female</b>	<b>Male</b>	<b>Sig.</b>
My direct line manager supports women in our department.	248	3.415	0.674	3.310	3.460	ns
In Anglo American South Africa, there are programmes that addresses the skills gap between women and men.	244	2.627	0.788	2.343	2.743	0.000***

Variable	n	Mean	Std.Dev	Female	Male	Sig.
In Anglo American South Africa, leadership supports the acquisition of new skills, irrespective of gender.	247	3.279	0.662	3.083	3.366	0.004***
In Anglo American South Africa, leadership involves women employees in decision-making.	246	3.163	0.644	2.831	3.308	0.000***
My line manager and leadership keep track of women's career progression.	247	2.903	0.748	2.639	3.012	0.001***

\* 0.05

\*\*  $p < 0.01$

\*\*\*  $p < 0.001$

A *t*-test in Table 4.3 above indicates that there were generally significant differences between male and female opinions of women's career advancement possibilities. Only one variable did not show any significant differences and that concerned line managers' support of women in their departments. The significant differences lay in the following factors: (i) programmes that address the skills gap between women and men,  $M = 2.627$ ,  $p < 0.001$ , with males scoring higher than females ( $X\text{-bar } 2.743$  vs  $X\text{-bar } 2.343$ ); (ii) leadership's involving women employees in decision-making,  $M = 3.163$ ,  $p < 0.001$ , with males scoring higher than females ( $X\text{-bar } 3.308$  vs  $X\text{-bar } 2.831$ ); (iii) Line managers and leadership keeping track of women's career progression,  $M = 2.903$ ,  $p < 0.001$ , with males scoring higher than females ( $X\text{-bar } 3.012$  vs  $X\text{-bar } 2.639$ ); and lastly (v) leadership's supporting the acquisition of new skills, irrespective of gender,  $M = 3.279$ ,  $p < 0.001$ , with males scoring higher than females ( $X\text{-bar } 3.366$  vs  $X\text{-bar } 3.083$ ).

The next subsection looks at the challenges experienced by South African women in mining.

#### 4.4.3 Objective 2: Challenges experienced by women in mining

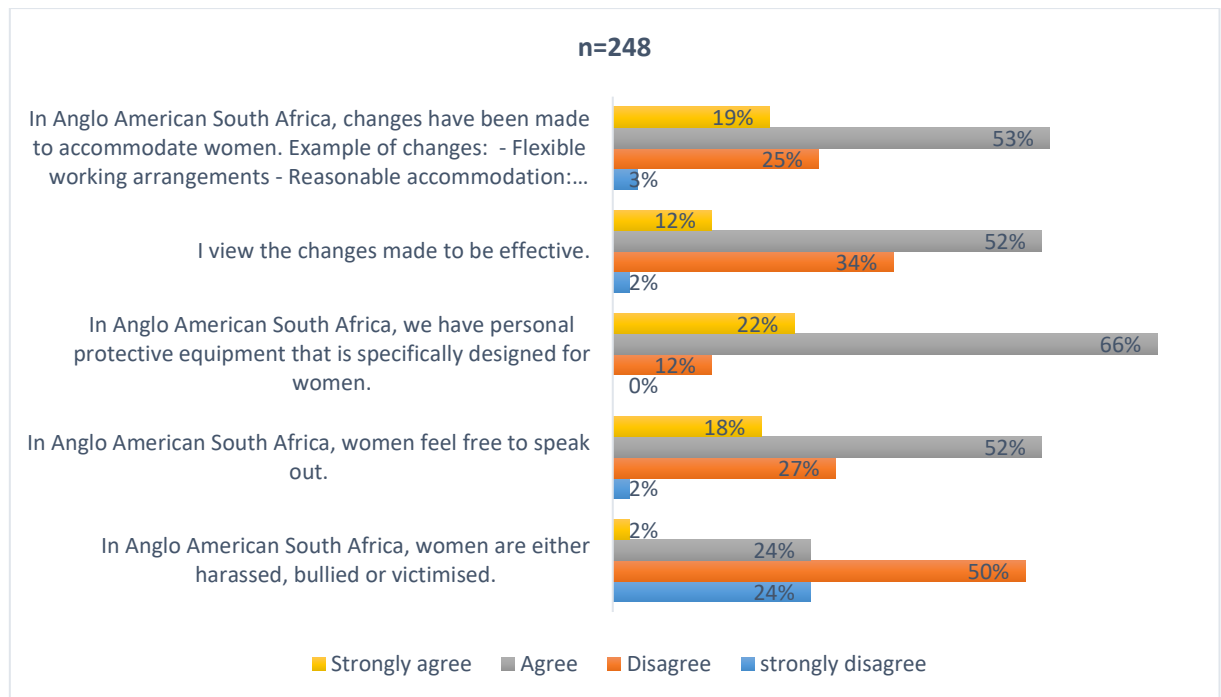


Figure 4.3: Challenges experienced by women in mining

Figure 4.3 above shows that the management of Anglo-American mining believe women face fewer challenges in the company. The results cannot be transferred to the company population as the views from women themselves were minimal. Outcomes might have been different if there had been an equal distribution of male and female respondents.

The majority of respondents agreed that changes have been made to accommodate women (53% and 19%); they viewed the changes made as effective (52% and 12%); they agreed there were PPEs specifically designed for women (66% and 22%); they believed women feel free to speak out (52% and 18%); and that women are not harassed (50% and 24%).

On a positive note, it appears that the company makes efforts to cater for women and to make their work environment bearable. This includes allowing women to be vocal about work-related challenges, and providing all the resources necessary for them to execute their tasks.

Table 4.4 below shows whether male and female respondents had the same view of the challenges experienced by women at Anglo American Mining South Africa.

Table 4.4: t-test showing means, standard deviations and significant differences between the opinions of males and female about challenges experienced by women at Anglo American Mining South Africa

Variable	N	Mean	Std.Dev	Female	Male	Sig.
In Anglo American South Africa, changes have been made to accommodate women. Example of changes: <ul style="list-style-type: none"> <li>• Flexible working arrangements</li> <li>• Reasonable accommodation: <ul style="list-style-type: none"> <li>• lactation facilities,</li> <li>• change rooms,</li> <li>• language,</li> <li>• culture</li> </ul> </li> </ul>	248	2.891	0.737	2.736	2.954	0.03*
I view the changes made to be effective.	248	2.742	0.678	2.611	2.792	ns
In Anglo American South Africa, we have personal protective equipment that is specifically designed for women.	248	3.093	0.586	3.042	3.115	ns
In Anglo American South Africa, women feel free to speak out.	249	2.867	0.731	2.486	3.029	0.000***
In Anglo American South Africa, women are either harassed, bullied or victimised.	250	2.060	0.766	2.264	1.977	0.007***

\* 0.05

\*\*  $p < 0.01$

\*\*\*  $p < 0.001$

Table 4.4 above indicates that, of all the five statements rated, there was a significant difference in only three of the statements, which were the following: (i) women feel free to speak out,  $M = 2.867$ ,  $p < 0.001$ , with males scoring high compared to females (X-bar 3.029 vs X-bar 2.486); (ii) women are not harassed at work (reversed statement),  $M = 2.060$ ,  $p < 0.001$ , with females scoring higher than males (X-bar 2.264 vs X-bar 1.977); and (iii) changes have been made to accommodate women,  $M = 2.891$ ,  $p < 0.05$ , with males scoring more than females (X-bar 2.954 vs X-bar 2.737).

There were no significant differences in the male and female views on the effectiveness of the changes made and on having PPEs specifically designed for women.

#### **4.5 CONCLUSION**

The findings clearly show that Anglo American South Africa is a company dominated by white males in the top and senior management positions. Their years of experience appear to be a plausible contributing factor in this regard as many of these employees have served the company for over ten years. Contrary to the aforementioned, the company prioritises transformation and embraces diversity. The results further indicate that women are included in almost all aspects of the company, and their opinions are valued when making decisions. However, what is unclear is whether or not there is a programme designed to bridge skills gaps, given an almost equal split of responses by those indicating that it exists and those reporting that it does not exist.

A fascinating insight from the data is the significant agreement that women face few challenges, given the number of males occupying top and senior management positions. While this may be a sign that all employees attempt in good faith to ensure that the work environment is conducive for women, it is undeniable that gender inequality continues to be an overarching challenge that women continue to be exposed to in the mining industry. This is supported by current statistics showing that there are not equal numbers of men and women in top and senior management positions.

Moreover, the responses to the statement that there are programmes to address the skills gap, where men scored higher than women, indicate that women may not be aware of such programmes because Anglo American has either not set them up or not communicated them clearly. The high probability that the statements made are true is displayed by strong significant values.

The next chapter presents conclusions about the findings described in this chapter and recommendations for responsive actions.

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

The purpose of this chapter is to summarise the findings from the study conducted on gender equality in top managerial positions in a South African mining company: Anglo American South Africa. The researcher shows how the objectives of this study were met and makes recommendations for a framework that will serve to reduce the gender differences within Anglo American.

#### **5.2 CONCLUSIONS OF THE STUDY**

The primary findings of this study reveal that there are clearly not equal numbers of women and men in top and senior management: This conclusion matches the statistics outlined in Chapter 1 (415 males and 111 females) that were the basis for the sample population in this study.

There is still a major under-representation of women in a number of areas of leadership and decision-making processes worldwide, as illustrated in Chapter 1 (Fortin et al., 2017; Maseko, 2013). In the mining industry, female under-representation persists, and there is continued public pressure about the rising levels of gender inequality in industries that are male-dominated (Eftimie et al., 2009). Due to the slow pace of its transformation and the continued low participation and slow advancement of women into senior positions, the South African mining industry has received growing criticism. Shabangu (2015) posits that this remains a vital problem in South Africa.

Besides the gender disparity, the study also revealed that Anglo American South Africa is still dominated by white males (Annexure C,2.3:3). These two facts were confirmed by Botha (2014), who stated that there is still a low representation of women on the boards of directors in mining companies, as well as in senior management and supervisory roles, and demonstrated the dominance of white males; he found, moreover, that women were still at the fringe of the industry.

The low number of females in executive management probably contributes to the lack of consideration for the needs of females in the workplace because decisions are made at top managerial levels so potential segregation could emanate (Hill et al., 2016). Hill

et al. (2016) suggested that the needs of females will remain unaddressed despite their being employed in the underground or top/senior management positions.

There is no clear-cut agreement from the respondents in relation to a programme designed to bridge skills gaps: 54% believe it exists, while 46% disagree. Zungu (2011) confirmed that women do not have the same skills as men. Closing the skills gap is essential for both genders to utilise their skills adequately. The absence of skills programmes exacerbates gender disparity.

It should however be noted that the picture at Anglo American is not unique in the mining industry. The Gender Commission of South Africa (2016–2017) reported that the mining company, Samancor, consisted predominantly of males, with no female representation at senior management level. Furthermore, the percentages of women in mining, as reported by the MCSA, was 20% in 2019.

The findings in this study, however, have positive elements, in that the respondents attested that Anglo American South Africa prioritises transformation and embraces diversity. Additionally, it was confirmed that women are included in almost every area of the business, including the consideration of their viewpoints when making decisions.

A secondary objective of this study was to identify the gender-different challenges faced by top and senior management position occupants. Women in Mining in Canada (2010) pointed out significant challenges in being employed and accepted in the mining industry, as well as in unsupportive work environments. The current study indicated that women are now said to be facing fewer challenges: Respondents reflected positivity relating to changes made to accommodate women and the effectiveness of the changes, especially with regard to women-specific policies and women physique-specific designs of PPE within the mining sector. Women have the freedom to speak out on matters affecting their welfare at work. Moreover, it was confirmed that women are not bullied, harassed or victimised.

The more positive responses in this study point to the strong values within Anglo American, which address the objective of discovering whether there are gender differences in personal values among top and senior management position occupants in the South African mining companies.

Anglo American South Africa should capitalise on these strengths for continuous progress towards ultimately bridging the gap between males and females, and should construct concrete programmes to bridge the skills gap. This will contribute to their attracting more women to positions in top and senior management.

### 5.3 RECOMMENDATIONS

Given the high percentage of males versus females in top and senior management positions, it is recommended that Anglo American South Africa do the following to address or close this gap:

- Fill all vacancies that are available on this level with female candidates whenever the opportunity presents itself
- Seek out promotion opportunities for female candidates so as to achieve parity of numbers in top and senior management positions vis-à-vis the positions occupied by males.
- In terms of succession planning, female candidates should be identified so as to ensure that, at each step of the strategic plan to achieve gender parity in top and senior management positions at Anglo American, there are candidates who are already in the staff establishment of the company and who intimately understand the organisational and operational cultures of the company and the need to transform aspects of these cultures.
- Anglo American can have female-only focused mentorship programmes and a female-only network group in which deliberate efforts at addressing female employees' employment equity issues will be undertaken.
- Anglo American should:
  - have gender awareness sessions and campaigns in addition to the training about unconscious bias and sexual harassment currently provided;
  - have regular diversity training;
  - set concrete targets and timelines for women in leadership;
  - draft policies on gender mainstreaming as it is embraced by other organisations, such as the ILO and the UN;
  - review existing policies and incorporate gender-related needs;
  - set aside educational funds for senior executive programmes targeted at females; and
  - conduct regular research to identify barriers and challenges for male and female employees, as well as to measure progress made.

The question that should be posed at this moment to wrap up the study as well as attend to the objective relating to the need to formulate a framework, is: What kind of framework emanates from the preceding insights? Tentatively, because the issues

highlighted in this research require further research, such a framework will entail the following:

- **End-to-end Compliance System:** Developing an in-house compliance system that seeks to align company policies and operations with the Constitution, applicable legislation, policies, regulations and guidelines, while benchmarking the company operations with global best practices with regard to the identification, attraction, recruitment, development and retention of females in(to) the company.
- **Female Workforce Databank:** Maintaining a database on all female employees in all the business units of Anglo American, with comprehensive details on their backgrounds, their current skills and aptitudes, and training and development requirements, their declared career aspirations and how these fit into Anglo American overall strategic objectives generally, and into the declared drive for gender parity at top and senior management positions.
- **Female Workforce Management Efficiencies:** Formulating and operationalising human resource processes and interventions aimed at optimising female workforce management efficiencies. These will be based on and justified through the recognition of women-specific attributes that enrich the company's institutional culture.
- **Female Workforce Outcomes Recognition:** Instituting company-wide culture and processes through which female workforce outcomes are recognised and rewarded.
- **Value-based Female Workforce Progression:** Aligning company values to be responsive to and supportive of the progression of the female workforce, especially into top and senior management positions in the company.

As already observed, however, these elements/aspects of a possible framework for gender parity at top and senior management positions within South Africa's mining sector generally, and in Anglo American specifically, still require more research. This observation notwithstanding, the outlined framework could form a solid base for such future research.

#### **5.4 LIMITATIONS OF THE STUDY**

Only one method was used to collect data (quantitative) for this study, namely the online survey method. This method was chosen mainly due to the geographical location of Anglo American four business units (Anglo Platinum, Coal, Kumba and De Beers) in different provinces, which would have posed a challenge had the researcher chosen to

conduct a qualitative study. Moreover, the time allowed for data collection was too confined to allow for any travel. This was exacerbated by the travel restrictions due to the lockdown that was imposed by government resulting from Covid-19.

## **5.5 CONCLUSION**

This study was about examining gender equality in top managerial positions in a South African mining company, Anglo American South Africa, which has four main business units: Platinum, Coal SA, Kumba Iron Ore and De Beers. The focus was on their top and senior managers. The findings after data collection revealed that there is still a gap between the males and females in the top managerial positions. This confirms the statement by Khoza (2015) that the South African mining sector has been receiving growing attention due to its slow pace of transformation to conform with gender equity legislation because there is low involvement and slow progression of women into senior management positions. It is imperative for the South African government, through the mandated department, to ensure compliance with its Employment Equity Act, 1998.

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## Annexure A. Informed Consent

3422 Andorra Street,  
Cosmo City, Ext 3,  
Randburg,  
2194

06 April 2020

Dear Sir/Madam,

### **PARTICIPATION IN A RESEARCH PROJECT**

I am currently enrolled for the Masters of Business Administration at the UFS and part of the requirements of obtaining the degree is the completion of a research project.

The title of the research project is Gender Equality in Top Managerial positions in a South African mining company. The primary objective of the research is to examine gender equality in top managerial positions in a South African mining company.

In order to complete the research project, I request that you participate by completing the following questionnaire. The questionnaire will take approximately 15 minutes.

Please complete the questionnaire on or before 31 July 2020.

Relevant ethical considerations are being observed by the researcher while conducting this study. Permission was obtained from Anglo American South African BU's (Anglo Platinum, Coal, Kumba and De Beers). The data will be kept anonymous and no identification questions are included. The information will be kept confidential and the reporting will only be made on the overall findings.

Participation in this research is on a voluntary basis. The researcher will not interfere in anyway with the information given on the respondents' questionnaires.

Where clarity is required, the researcher can be contacted at:

Your contact details: Kutlwano Takadi  
Contact nrs: 011 309 3622 / 072 836 6154  
Email address: Kutlwano.Takadi@debeersgroup.com

Your time and effort taken in filling the questionnaire are appreciated in advance. Thank you for contributing to the success of this research.

Regards



Kutlwano Gwendoline Takadi

Transformation and Regulatory Affairs Manager

## SECTION 1: BIOGRAPHICAL DATA

1.1 Age	
<20 yrs	1
21-30 yrs	2
31-40 yrs	3
41-50 yrs	4
51-60 yrs	5

1.2 Gender	
Male	1
Female	2
Gender Non- conforming	3

1.3 Demographic	
African	1
Coloured	2
Indian	3
White	4
Foreign National	5
Other	6

1.4 Marital status	
Single	1
In a relationship	2
Married	3
Divorced	4
Other	5

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**1.5 Children**

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0	1
1	2
2	3
3	4
4 and above	5

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## SECTION 2: QUALIFICATIONS AND JOB EXPERIENCE

2.1	Please indicate your highest educational qualification (use equivalents where necessary)					
	Below Grade 12	Grade 12	Degree/Diplom a	Postgraduate degree	Other (Please specify)	
2.2	Please indicate your current role					
	Top management ( <b>Board Member, Registered Director</b> )		Senior management ( <b>GBF 3, 4, 5</b> )			
2.3	Please indicate your experience in the mining industry					
	< 1 year	1-2 years	3-5 years	6-10 years	>10 years	
2.3	How did you acquire mining skills?					
	Risen through the ranks	Internal Promotion	Formal Education	On-the-job training	Self-Study	Aptitude and Ability

### SECTION 3: PERCEPTION OF WOMEN IN MINING

Please rate the following statements on a scale of 1-4 where 1= strongly disagree and 4=strongly agree

1	2	3	4
Strongly disagree	Disagree	Agree	Strongly agree

3.1 In Anglo American South Africa, transformation is consistently on top of the agenda	1	2	3	4
3.2 In Anglo American South Africa, Top management encourages all employees to embrace diversity	1	2	3	4
3.3 In Anglo American South Africa, Senior management encourages all employees to embrace diversity	1	2	3	4
3.4 Top management always reminds us of the important contribution that women make in our business	1	2	3	4
3.5 In Anglo American South Africa, there is an equal number of men and women in Top management	1	2	3	4
3.6 In Anglo American South Africa, there is an equal number of men and women in Senior management	1	2	3	4

#### SECTION 4: CAREER ADVANCEMENT

Please rate the following statements on a scale of 1-4 where 1= strongly disagree and 4=strongly agree

1	2	3	4
Strongly disagree	Disagree	Agree	Strongly agree

4.1 My direct line manager supports women in our department	1	2	3	4
4.2 In Anglo American South Africa there are programmes that addresses the skills gap between women and men	1	2	3	4
4.3 In Anglo American South Africa, leadership supports the acquisition of new skills irrespective of gender	1	2	3	4
4.4 In Anglo American South Africa, leadership involves women employees in decision-making	1	2	3	4
4.5 My line manager and leadership keep track of women's career progression	1	2	3	4

## SECTION 5: CHALLENGES EXPERIENCED BY WOMEN IN MINING

Please rate the following statements on a scale of 1-4 where 1= strongly disagree and 4=strongly agree

1	2	3	4
Strongly disagree	Disagree	Agree	Strongly agree

5.1 In Anglo American South Africa, changes have been made to accommodate women  <b>Example of changes:</b>  Flexible working arrangements.  Reasonable accommodation: lactation facilities, change rooms, language, culture etc.	1	2	3	4
5.2 I view the changes made to be effective.	1	2	3	4
5.3 In Anglo American South Africa, we have personal protective equipment that is specifically designed for women	1	2	3	4
5.4 In Anglo American South Africa, women feel free to speak out	1	2	3	4
5.5 In Anglo American South Africa, women are either harassed, bullied or victimised	1	2	3	4

## **Annexure B. Permission Letter**

### **Request for permission to conduct research at four of the Anglo American South African Business Units.**

#### **PERMISSION LETTER**

**Request for permission to conduct research at an Anglo American South Africa - Business Unit, De Beers Group.**

GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY

08 May 2020

Mr Innocent Mabusela  
De Beers Group Headquarters, Johannesburg  
Corporate Affairs Department  
+27113747798  
Innocent.Mabusela@debeersgroup.com

Dear Head of Corporate Affairs, Mr Innocent Mabusela,

I, Kutlwano Gwendoline Takadi am doing research with Helena Van Zyl, a Professor in the Business School towards a Masters of Business Administration at the University of the Free State. We are inviting you to participate in a study entitled GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY.

The primary objective of the study is to examine gender equality in top managerial positions in a South African mining company

Anglo American South Africa has been selected because it meets the selection criteria of the study in examination.

The study will entail: Exploring the causes of gender differences relating to why women do not progress to senior leadership positions; determining gender differences in terms of personal values among top and senior management position occupants in the South African mining companies; discovering the gender differences in terms of strengths and weakness among top and senior management position occupants in the South African mining companies; identifying the gender difference challenges faced by top and senior management position occupants in the South African mining companies; and lastly developing a framework that aims to reduce the gender differences within Anglo American.

The procedures to be followed is a dissemination of questionnaires to the participants post discussions with the unit heads in each BU's.

The benefits of this study will entail gaining knowledge on the challenges faced by women in the industry in terms of the inability to progress to top management positions

No potential risks have been identified as the study contains no question that could evoke respondents' emotions

Feedback procedure will be in a form of presentation to the BU's and the presentation slides that will be shared with the respondents.

If you agree, kindly sign below and return the signed letter via e mail to me. Alternatively, kindly submit a signed letter of permission on your institution's letterhead acknowledging your consent and permission for me to conduct this survey/study at your institution.

Yours sincerely,

  
Kullwaño Gwendoline Takadi

Transformation and Regulatory Affairs Manager

08/05/2020  
Signature Date

Approved by:



Mr Innocent Mabusela  
Head of Corporate Affairs

Digitally signed by Mabusela,  
Innocent  
Date: 2020.05.19 18:09:40 +02'00'

Signature Date

## PERMISSION LETTER

### **Request for permission to conduct research at an Anglo American South Africa - Business Unit, Coal.**

GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY

08 May 2020

Ms. Mpumi Sithole  
Anglo American Coal Headquarters, Johannesburg  
Corporate Affairs Department  
+27116387218  
mpumi.sithole@angloamerican.com

Dear Head of Corporate Affairs, Ms. Mpumi Sithole,  
I, Kutiwano Gwendoline Takadi am doing research with Helena Van Zyl, a Professor in the Business School towards a Masters of Business Administration at the University of the Free State. We are inviting you to participate in a study entitled GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY.

The primary objective of the study is to examine gender equality in top managerial positions in a South African mining company

Anglo American South Africa has been selected because it meets the selection criteria of the study in examination.

The study will entail: Exploring the causes of gender differences relating to why women do not progress to senior leadership positions; determining gender differences in terms of personal values among top and senior management position occupants in the South African mining companies; discovering the gender differences in terms of strengths and weakness among top and senior management position occupants in the South African mining companies; identifying the gender difference challenges faced by top and senior management position occupants in the South African mining companies; and lastly developing a framework that aims to reduce the gender differences within Anglo American.

The procedures to be followed is a dissemination of questionnaires to the participants post discussions with the unit heads in each BU's.

The benefits of this study will entail gaining knowledge on the challenges faced by women in the industry in terms of the inability to progress to top management positions

No potential risks have been identified as the study contains no question that could evoke respondents' emotions

Feedback procedure will be in a form of presentation to the BU's and the presentation slides that will be shared with the respondents.

If you agree, kindly sign below and return the signed letter via e-mail to me. Alternatively, kindly submit a signed letter of permission on your institution's letterhead acknowledging your consent and permission for me to conduct this survey/study at your institution.

Yours sincerely,

  
\_\_\_\_\_

Kufwana Gwendoline Takadi  
Transformation and Regulatory Affairs Manager

08/05/2020

Signature Date

Approved by:

  
\_\_\_\_\_

Ms. Mpumi Sithole  
Head of Corporate Affairs

18/05/2020

Signature Date

## PERMISSION LETTER

**Request for permission to conduct research at an Anglo American South Africa - Business Unit, Platinum.**

GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY

08 May 2020

Ms. Yvonne Mfolo  
Anglo American Platinum Headquarters, Johannesburg  
Corporate Affairs Department  
+27126837067  
yvonne.mfolo2@angloamerican.com

Dear Head of Corporate Affairs, Ms. Yvonne Mfolo,

I, Kutlwano Gwendoline Takadi am doing research with Helena Van Zyl, a Professor in the Business School towards a Masters of Business Administration at the University of the Free State. We are inviting you to participate in a study entitled GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY.

The primary objective of the study is to examine gender equality in top managerial positions in a South African mining company

Anglo American South Africa has been selected because it meets the selection criteria of the study in examination.

The study will entail: Exploring the causes of gender differences relating to why women do not progress to senior leadership positions; determining gender differences in terms of personal values among top and senior management position occupants in the South African mining companies; discovering the gender differences in terms of strengths and weakness among top and senior management position occupants in the South African mining companies; identifying the gender difference challenges faced by top and senior management position occupants in the South African mining companies; and lastly developing a framework that aims to reduce the gender differences within Anglo American.

The procedures to be followed is a dissemination of questionnaires to the participants post discussions with the unit heads in each BU's.

The benefits of this study will entail gaining knowledge on the challenges faced by women in the industry in terms of the inability to progress to top management positions

No potential risks have been identified as the study contains no question that could evoke respondents' emotions.

Feedback procedure will be in a form of presentation to the BU's and the presentation slides that will be shared with the respondents.

If you agree, kindly sign below and return the signed letter via e-mail to me. Alternatively, kindly submit a signed letter of permission on your institution's letterhead acknowledging your consent and permission for me to conduct this survey/study at your institution.

Yours sincerely,




Kutlwano Gwendoline Takadi  
Transformation and Regulatory Affairs Manager

08/05/2020

Signature Date

Approved by:



Ms. Yvonne Mfofo  
Head of Corporate Affairs

29/6/20

Signature Date

## PERMISSION LETTER

**Request for permission to conduct research at an Anglo American South Africa - Business Unit, Kumba Iron Ore.**

GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY

08 May 2020

Mr Samuel Martin  
Kumba Iron Ore Headquarters, Centurion  
Corporate Affairs Department  
+2712 6792093  
Samuel.martin@angloamerican.com

Dear Head of Corporate Affairs, Mr Samuel Martin,

I, Kullwano Gwendoline Takadi am doing research with Helena Van Zyl, a Professor in the Business School towards a Masters of Business Administration at the University of the Free State. We are inviting you to participate in a study entitled GENDER EQUALITY IN TOP MANAGERIAL POSITIONS IN A SOUTH AFRICAN MINING COMPANY.

The primary objective of the study is to examine gender equality in top managerial positions in a South African mining company

Anglo American South Africa has been selected because it meets the selection criteria of the study in examination.

The study will entail: Exploring the causes of gender differences relating to why women do not progress to senior leadership positions; determining gender differences in terms of personal values among top and senior management position occupants in the South African mining companies; discovering the gender differences in terms of strengths and weakness among top and senior management position occupants in the South African mining companies; identifying the gender difference challenges faced by top and senior management position occupants in the South African mining companies; and lastly developing a framework that aims to reduce the gender differences within Anglo American.

The procedures to be followed is a dissemination of questionnaires to the participants post discussions with the unit heads in each BU's.

The benefits of this study will entail gaining knowledge on the challenges faced by women in the industry in terms of the inability to progress to top management positions

No potential risks have been identified as the study contains no question that could evoke respondents' emotions

Feedback procedure will be in a form of presentation to the BU's and the presentation slides that will be shared with the respondents.

If you agree, kindly sign below and return the signed letter via e-mail to me. Alternatively, kindly submit a signed letter of permission on your institution's letterhead acknowledging your consent and permission for me to conduct this survey/study at your institution.

Yours sincerely,

  
\_\_\_\_\_

Kulwano Gwendoline Takadi  
Transformation and Regulatory Affairs Manager

08/05/2020  
Signature Date

Approved by:

  
\_\_\_\_\_

Mr Samuel Martin  
Head of Corporate Affairs

13/6/20  
Signature Date

## Annexure C. Survey Analysis for Kutlwano Takadi

Sean van der Merwe

2020-09-08

### Annexure A. Links

[Consultation Unit](#)

[Consultant](#)

[Frequently asked questions](#)

#### 1. Introduction and disclaimer

Throughout our analysis, we must remember at all times that we are making judgements on the perceptions of people such as those who responded to this survey. [People who choose to respond to surveys may be systematically different from the general population. See the Wikipedia page on Response Bias for more information.](#)

Similarly, the survey was only presented to a specific group of people, and we should not try to extend the results beyond that group without seriously considering and accounting for any systematic differences between that group and any broader group.

The data analysed here is inherently random. If the survey were to be repeated then the results will differ. We will try to estimate the extent to which this will be the case, but those estimates are themselves uncertain.

While [the computer software used](#) is tried and tested, the analysis involves multiple human elements. Both the client and statistician may have introduced human error at various stages of the research process.

***Thus, no guarantee can ultimately be given on the correctness of any findings below.***

Links are given occasionally to sources explaining the statistical concepts addressed. These are colloquial sources to aid understanding, not reference sources. However, most of these sources link to reference sources, should the researcher require academic references for specific topics.

#### 1.1 Data properties

The data was converted from SPSS format to Excel format, then reworked in Excel until usable for analysis in R.

***Rows where respondents selected 'No' to consent were dropped from all analyses entirely (not even counted).***

**Rows where respondents failed to select 'Yes' clearly for all consent questions were also dropped, even though sometimes such people then continued to take part in the survey.** It is debatable whether these should be included or not, but it is ethically safer to exclude them.

The nominal questions are 2.2), 2.3), 2.4), 3.1), 3.2), 3.4), numbering 6 in total; the ordinal questions are 2.1), 2.5), 3.3), numbering 3 in total; the Likert Scale questions are 4.1), 4.2), 4.3), 4.4), 4.5), 4.6), 4.7), 5.1), 5.2), 5.3), 5.4), 5.5), 6.1), 6.2), 6.3), 6.4), 6.5), numbering 17 in total.

The significance level chosen is 0.05. [This means that we only look at results where the p-value is less than](#) 0.05, as other results could easily just be chance variation.

## 1.2 Statistical discussion of results

In this section some notable results may be highlighted by the statistician at their discretion. Other interesting results may exist in the data or analysis that are not noted, this discussion is not exhaustive.

Care should be taken to look at the results with strong statistical significance first (smallest p-values).

- Too few Top Management responses were received for doing any statistical comparisons between top and senior managers. The rest of the results thus pertain to top and senior managers as a single group, with the emphasis almost entirely on senior managers.
- The very last question was asked in a reverse manner to the rest, so for that question a low response would be good. For all other questions we would have liked to see a high response.
- We observed positive responses (in the desired direction) for all questions except 3: there is clearly *not an equal number of women and men* in top and senior management, and there is no consensus about programmes to address skills gaps.
- Female and male respondents responded significantly differently to almost all questions (all except 4.3, 5.1, 6.1, 6.2, 6.3), with female respondents giving less positive or more negative responses in all cases. Clearly ***the female respondents perceive more issues and/or perceive the issues more severely than male respondents.***
- The correlations suggest that *older and more experienced respondents perceived less issues than younger respondents.* The younger respondents responded significantly less positively to Questions 4.1, 4.2, 5.3, 5.4, 5.5, 6.1, 6.2, and 6.4. The less experienced respondents responded significantly less positively to Questions 4.1, 4.2, 5.2, 5.3, 5.4, 5.5, and 6.3.

## 2. Frequencies of responses

We create summary tables for each question as if they were purely categorical.

We also do  $\chi^2$  (Chi Square) tests for each question. We make the assumption that the expected number of responses in every category (agree, disagree, etc.) is the same for a single question. We then calculate the probability of seeing differences in the categories as large or larger than what we observe under the

assumption. If this probability is small we conclude that there is evidence of grouping and that people answered deliberately (not at random). This is seldom relevant to the analysis but is done just as a basic check, it can be ignored if the results are as expected.

## 2.1 Age

$p$ -value = 0

Response	Frequency	Relative Frequency
18-20 yrs	0	0.00
21-30 yrs	0	0.00
31-40 yrs	59	0.24
41-50 yrs	113	0.46
51-60 yrs	76	0.31

## 2.2 Gender

$p$ -value = 0

Response	Frequency	Relative Frequency
Male	175	0.71
Female	72	0.29
Gender Non- conforming	1	0.00

## 2.3 Demographic

$p$ -value = 0

Response	Frequency	Relative Frequency
African	90	0.37
Coloured	12	0.05
Indian	26	0.11
White	108	0.44
Foreign National	8	0.03
Other	1	0.00

## 2.4 Marital status

$p$ -value = 0

Response	Frequency	Relative Frequency
Single	16	0.07
In a relationship	13	0.05
Married	202	0.82
Divorced	8	0.03
Other	6	0.02

## 2.5 Children

$p$ -value = 0

Response	Frequency	Relative Frequency
0	32	0.13
1	38	0.15
2	93	0.38
3	51	0.21
4 and above	32	0.13

## 3.1)

Please indicate your highest educational qualification (use equivalents where necessary)

$p$ -value = 0

Response	Frequency	Relative Frequency
Below Grade 12	0	0.00
Grade 12	4	0.02
Degree/Diploma	80	0.32
Postgraduate degree	161	0.65
Other	4	0.02

### 3.2)

Please indicate your current role

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Top management (Board Member, Registered Director)	6	0.02
Senior management (GBF 3,4,5)	241	0.98

### 3.3)

Please indicate your experience in the mining industry

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
< 1 year	2	0.01
1-2 years	5	0.02
3-5 years	8	0.03
6-10 years	22	0.09
>10 years	209	0.85

### 3.4)

How did you acquire mining skills

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Risen through the ranks	64	0.26
Internal promotion	17	0.07
Formal education	89	0.36
On-the-job-training	35	0.14
Self-study	8	0.03

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Aptitude and ability	36	0.14

#### 4.1)

In Anglo American South Africa, transformation is consistently on top of the agenda.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	4	0.02
Disagree	25	0.10
Agree	138	0.55
Strongly agree	83	0.33

#### 4.2)

In Anglo American South Africa, Top management encourages all employees to embrace diversity.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	3	0.01
Disagree	8	0.03
Agree	117	0.47
Strongly agree	122	0.49

#### 4.3)

In Anglo American South Africa, Senior management encourages all employees to embrace diversity.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	2	0.01

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Disagree	17	0.07
Agree	133	0.53
Strongly agree	98	0.39

#### 4.4)

Top management always reminds us about the important contribution that women make in our business.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	2	0.01
Disagree	45	0.18
Agree	126	0.51
Strongly agree	75	0.30

#### 4.5)

Senior management always reminds us about the important contribution that women make in our business.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	5	0.02
Disagree	64	0.26
Agree	129	0.52
Strongly agree	52	0.21

#### 4.6)

In Anglo American South Africa, there is an equal number of men and women in Top management.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	84	0.34
Disagree	138	0.56
Agree	23	0.09
Strongly agree	3	0.01

#### 4.7)

In Anglo American South Africa, there is an equal number of men and women in Senior management.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	80	0.32
Disagree	140	0.56
Agree	24	0.10
Strongly agree	5	0.02

#### 5.1)

My direct line manager supports women in our department.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	4	0.02
Disagree	14	0.06
Agree	105	0.42
Strongly agree	125	0.50

#### 5.2)

In Anglo American South Africa, there are programmes that addresses the skills gap between women and men.

$p$ -value = 0

---

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	13	0.05
Disagree	99	0.41
Agree	98	0.40
Strongly agree	34	0.14

---

### 5.3)

In Anglo American South Africa, leadership supports the acquisition of new skills irrespective of gender.

$p$ -value = 0

---

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	3	0.01
Disagree	20	0.08
Agree	129	0.52
Strongly agree	95	0.38

---

### 5.4)

In Anglo American South Africa, leadership involves women employees in decision-making.

$p$ -value = 0

---

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	4	0.02
Disagree	22	0.09
Agree	150	0.61
Strongly agree	70	0.28

---

### 5.5)

My line manager and leadership keep track of women's career progression.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	7	0.03
Disagree	61	0.25
Agree	128	0.52
Strongly agree	51	0.21

---

### 6.1)

In Anglo American South Africa, changes have been made to accommodate women. Example of changes: - Flexible working arrangements - Reasonable accommodation: lactation facilities, change rooms, language, culture etc.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	7	0.03
Disagree	61	0.25
Agree	132	0.53
Strongly agree	48	0.19

---

### 6.2)

I view the changes made to be effective.

$p$ -value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	4	0.02
Disagree	85	0.34
Agree	130	0.52
Strongly agree	29	0.12

---

**6.3)**

In Anglo American South Africa, we have personal protective equipment that is specifically designed for women.

p-value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	1	0.00
Disagree	29	0.12
Agree	164	0.66
Strongly agree	54	0.22

---

**6.4)**

In Anglo American South Africa, women feel free to speak out.

p-value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	6	0.02
Disagree	67	0.27
Agree	130	0.52
Strongly agree	46	0.18

---

**6.5)**

In Anglo American South Africa, women are either harassed, bullied or victimised.

p-value = 0

<b>Response</b>	<b>Frequency</b>	<b>Relative Frequency</b>
Strongly disagree	59	0.24
Disagree	124	0.50
Agree	60	0.24
Strongly agree	7	0.03

---

### **3. Missingness**

Next we summarise non-response. Excessive non-response can result in biased analyses. We summarise the missingness per question and store this in the Excel file.

### **4. Descriptive Statistics for Ordinal and Scale Questions**

**Responses to the questions are now coded as 1, 2, 3, ..., where 1 is the lowest on the scale.**

We summarise the numeric responses by their count, mean (average), standard deviation, minimum, maximum, expected value under the null hypothesis that the responses are purely noise, and p-value of testing that null hypothesis. The statistical test used here is [the t-test](#).

Additionally, we report the mean responses for women and men, and a p-value of the two sample t-test of whether these averages are different.

These results are written to Excel also.

Ques	Count	Mean	Std.Dev	Min	Max	NullExp	pvalueNull	Female	Male	pvalDif_t	pvalDif_U	pvalDif_Bootstrap	Description
2.1)	248	4.069	0.736	3	5	3.0	0.000	3.875	4.144	0.007	0.009	0.006	Age
2.5)	246	3.053	1.185	1	5	3.0	0.485	2.662	3.214	0.001	0.001	0.002	Children
3.3)	246	4.752	0.688	1	5	3.0	0.000	4.500	4.854	0.008	0.023	0.003	Experience
4.1)	250	3.200	0.677	1	4	2.5	0.000	3.014	3.280	0.010	0.012	0.008	TopOfAgenda
4.2)	250	3.432	0.619	1	4	2.5	0.000	3.306	3.486	0.044	0.032	0.038	TopDiversity
4.3)	250	3.308	0.631	1	4	2.5	0.000	3.222	3.343	0.184	0.187	0.186	SeniorDiversity
4.4)	248	3.105	0.712	1	4	2.5	0.000	2.806	3.231	0.000	0.000	0.000	TopMakeInBus
4.5)	250	2.912	0.734	1	4	2.5	0.000	2.667	3.017	0.000	0.001	0.000	SeniorMakeInBus
4.6)	248	1.778	0.658	1	4	2.5	0.000	1.556	1.867	0.000	0.001	0.000	EqualNTop
4.7)	249	1.815	0.682	1	4	2.5	0.000	1.597	1.897	0.001	0.002	0.000	EqualNSenior
5.1)	248	3.415	0.674	1	4	2.5	0.000	3.310	3.460	0.147	0.218	0.146	LMsupportsW
5.2)	244	2.627	0.788	1	4	2.5	0.012	2.343	2.743	0.000	0.000	0.000	SkillsGap
5.3)	247	3.279	0.662	1	4	2.5	0.000	3.083	3.366	0.004	0.005	0.003	NewSkills
5.4)	246	3.163	0.644	1	4	2.5	0.000	2.831	3.308	0.000	0.000	0.000	DecisionMaking

Ques	Count	Mean	Std.Dev	Min	Max	NullExp	pvalueNull	Female	Male	pvalDif_t	pvalDif_U	pvalDif_Bootstrap	Description
5.5)	247	2.903	0.748	1	4	2.5	0.000	2.639	3.012	0.001	0.001	0.001	MyProgression
6.1)	248	2.891	0.737	1	4	2.5	0.000	2.736	2.954	0.039	0.034	0.038	ChangesMade
6.2)	248	2.742	0.678	1	4	2.5	0.000	2.611	2.792	0.073	0.060	0.067	ChangesEffective
6.3)	248	3.093	0.586	1	4	2.5	0.000	3.042	3.115	0.332	0.294	0.323	SpecDesigned
6.4)	249	2.867	0.731	1	4	2.5	0.000	2.486	3.029	0.000	0.000	0.000	FreeToSpeakOut
6.5)	250	2.060	0.766	1	4	2.5	0.000	2.264	1.977	0.007	0.010	0.005	HarassedBullied

**The idea is to compare the mean (average) to the value that would be expected if nobody had an opinion and just answered the question at random (NullExp).** The p-value is roughly the probability of seeing a difference as large or larger than what we see, under the assumption that the values actually are the same in the population. Thus, *if the p-value is small then we reject our assumption and say that the responses are significant* for that question.

## 5. Excel output

For more results see TakadiKresults.xlsx.

## 6. Congeneric Reliability

In this section the goal is to determine to what extent specific sets of question measure the same thing. It is based on [factor analysis](#) - we try to find an underlying factor explaining the responses to a group of questions as a whole. [The measures calculated here](#) are related to the famous Cronbach's  $\alpha$ , but considered more accurate.

Reliability measures lower than about 0.7 suggest that multiple concepts are being measured; while measures above 0.95 suggest that you are asking exactly the same thing in different words. [If you are trying to measure a single concept reliably then a value in the target range of 0.7 to 0.95 is desired.](#)

If you are trying to measure different concepts then you can use a reliability analysis to check whether the respondents understood the distinctions, and look for a low reliability score.

**Reliability tests require all questions to be asking in the same direction.** For this survey not all questions were asked in the same direction, thus *for this analysis only we flipped the following questions around numerically*: 6.5).

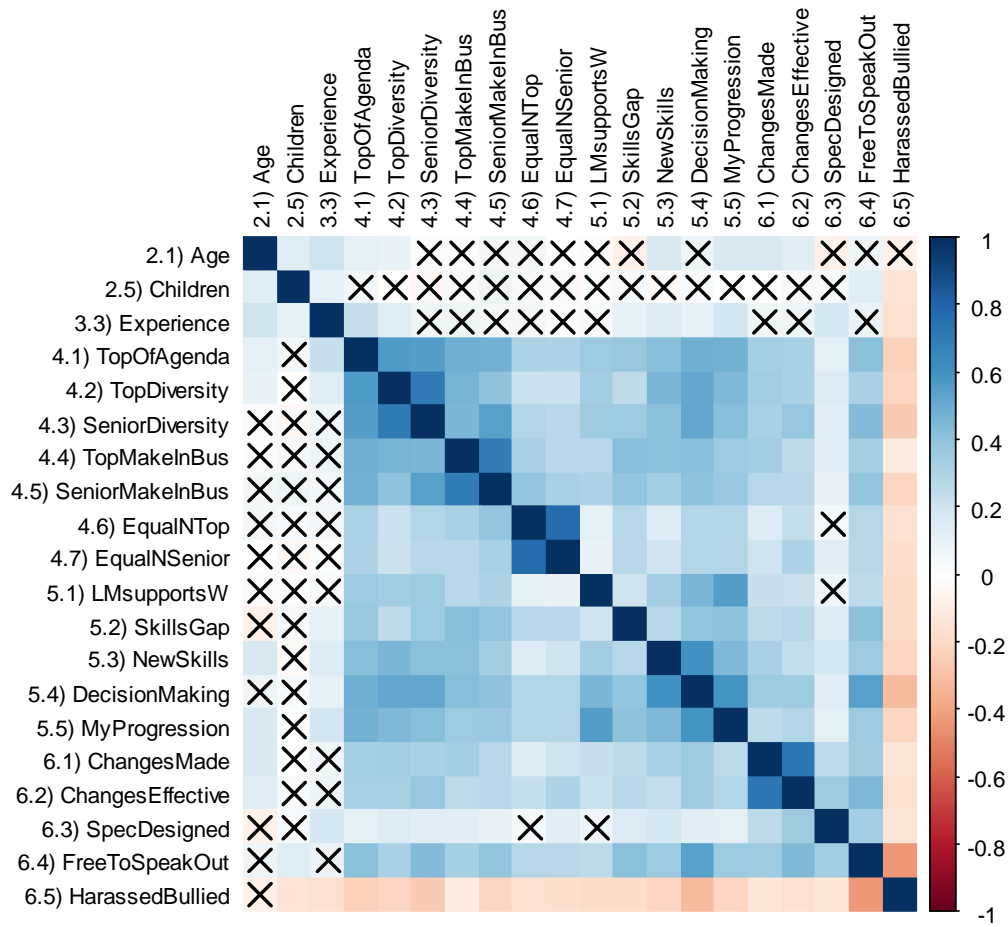
In this survey we evaluate reliability for 3 set(s) of questions.

```
## Reliability evaluation 1, called Perception of women in mining, comparing Questions  
4.1), 4.2), 4.3), 4.4), 4.5), 4.6), 4.7), produces a reliability factor of 0.84.  
## Reliability evaluation 2, called Career advancement, comparing Questions 5.1), 5.2),  
5.3), 5.4), 5.5), produces a reliability factor of 0.8.  
## Reliability evaluation 3, called Challenges experienced by women in mining,  
comparing Questions 6.1), 6.2), 6.3), 6.4), 6.5), produces a reliability factor of 0.72.
```

## 7. Correlations

We calculate the [Pearson correlation coefficients](#) using the transformed data. Positive correlations indicate responses that tend to vary (move around) in the same direction. Negative correlations are an indication of responses going counter to each other. Correlations that are not statistically different from zero will be marked as such with a cross.

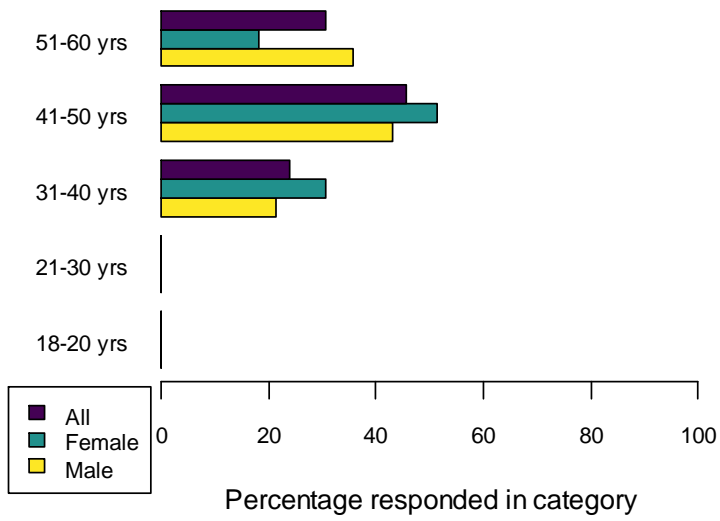
We give a plot of all the correlations that can be calculated.



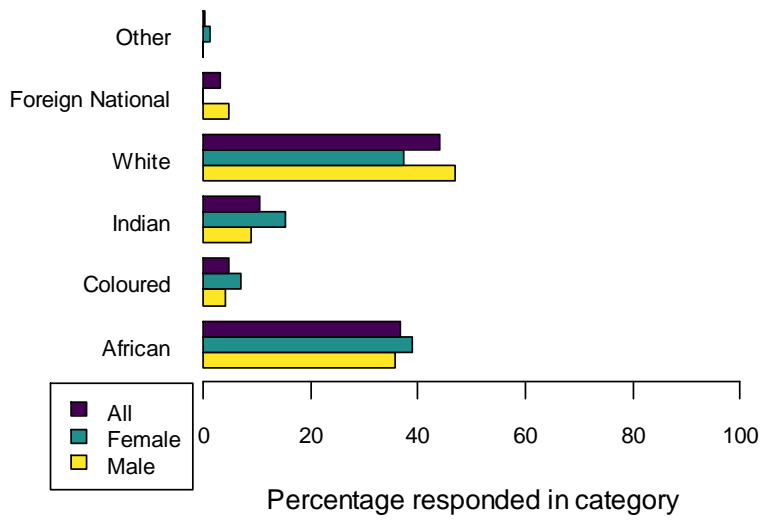
## 8. Female vs male responses

Here we graph the relative responses to each question as percentages. This is to show the patterns of response clearly and visually. We then show the patterns for female respondents and the patterns for male respondents on the same graph so that the patterns can be compared.

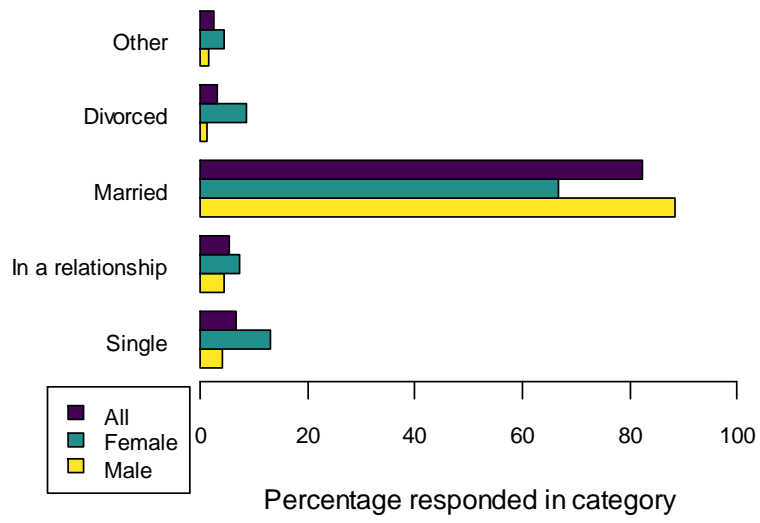
### 2.1): Age



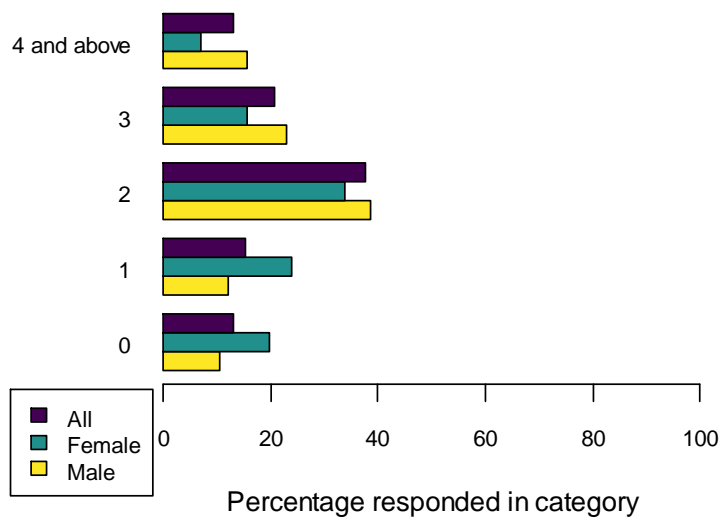
### 2.3): Demographic



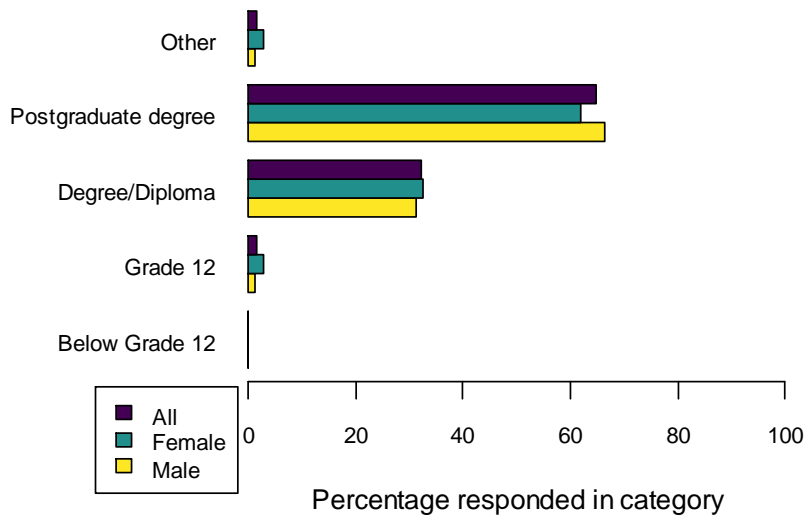
### 2.4): Marital status



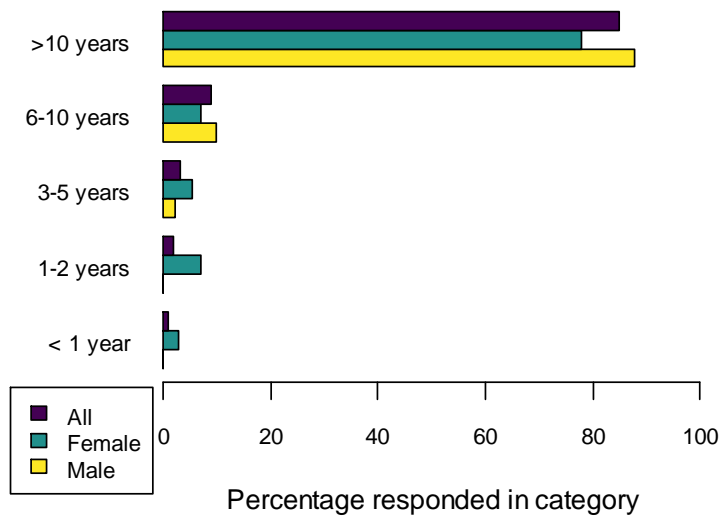
### 2.5): Children



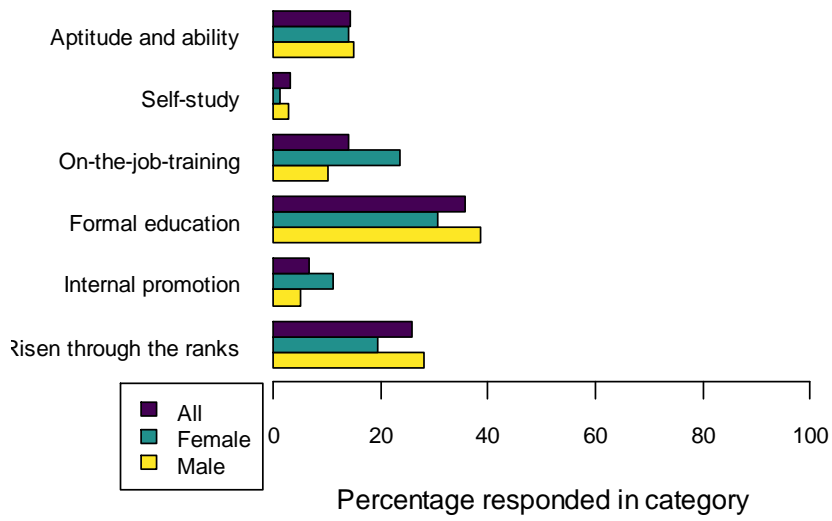
**3.1): Please indicate your highest educational qualification (use equivalents where necessary)**



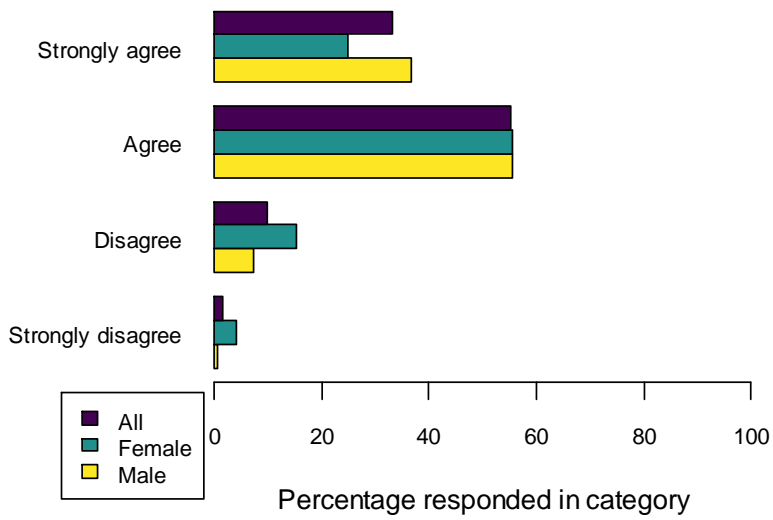
**3.3): Please indicate your experience in the mining industry**



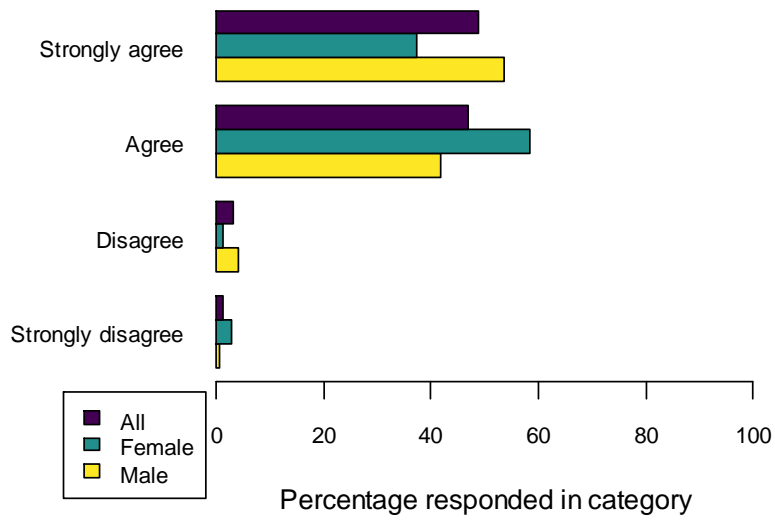
**3.4): How did you acquire mining skills**



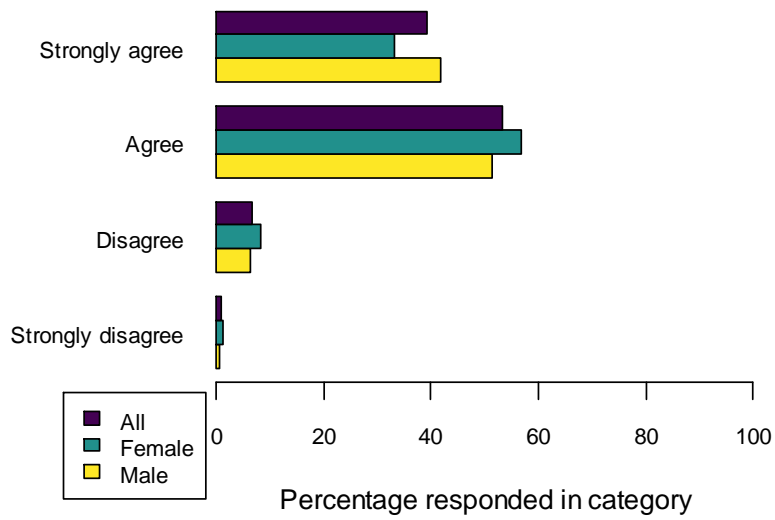
**4.1): In Anglo American South Africa, transformation is consistently on top of the agenda.**



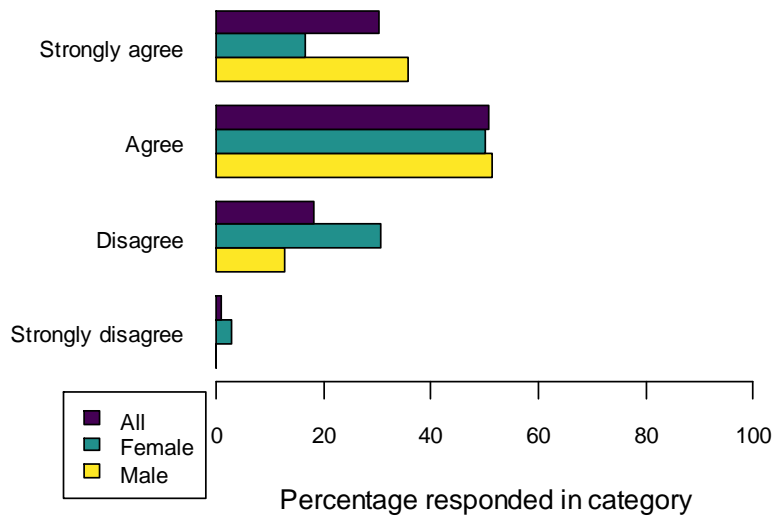
**4.2): In Anglo American South Africa, Top management encourages all employees to embrace diversity.**



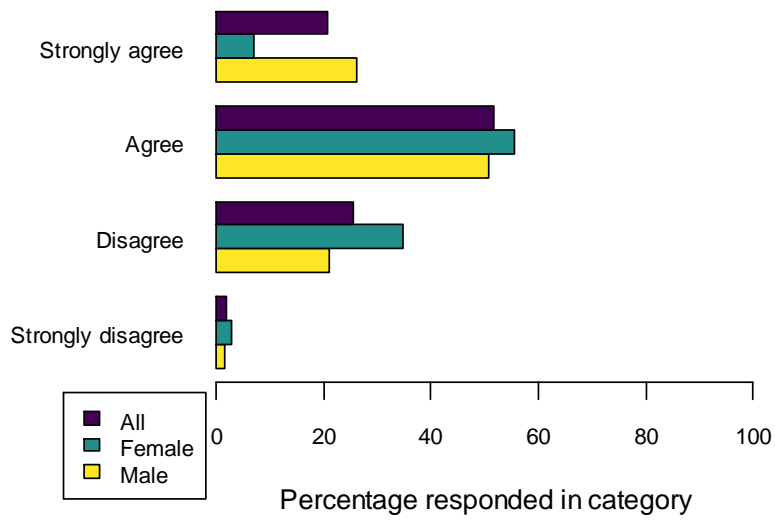
**4.3): In Anglo American South Africa, Senior management encourages all employees to embrace diversity.**



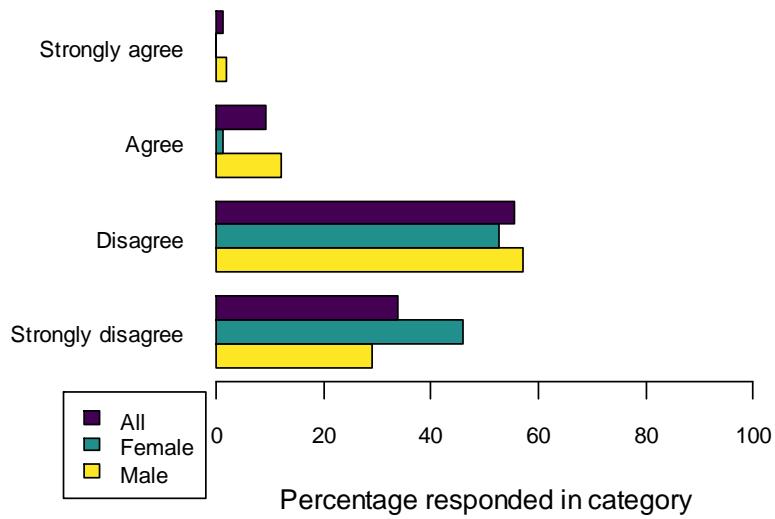
**4.4): Top management always reminds us about the important contribution that women make in our business.**



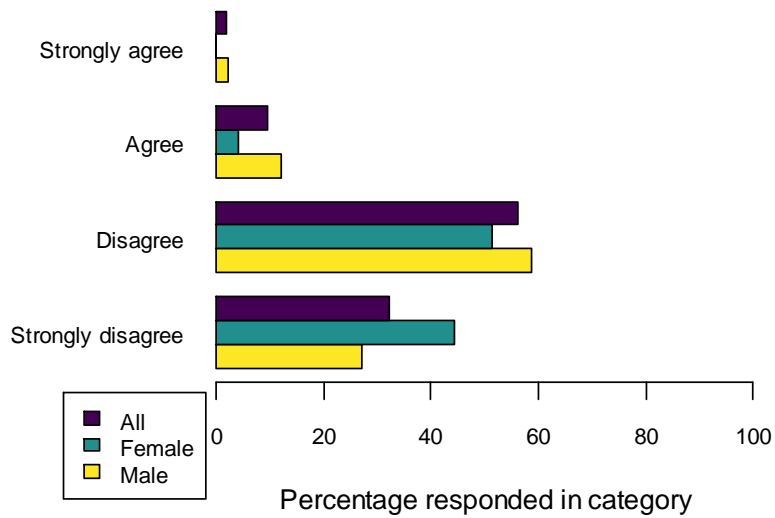
**4.5): Senior management always reminds us about the important contribution that women make in our business.**



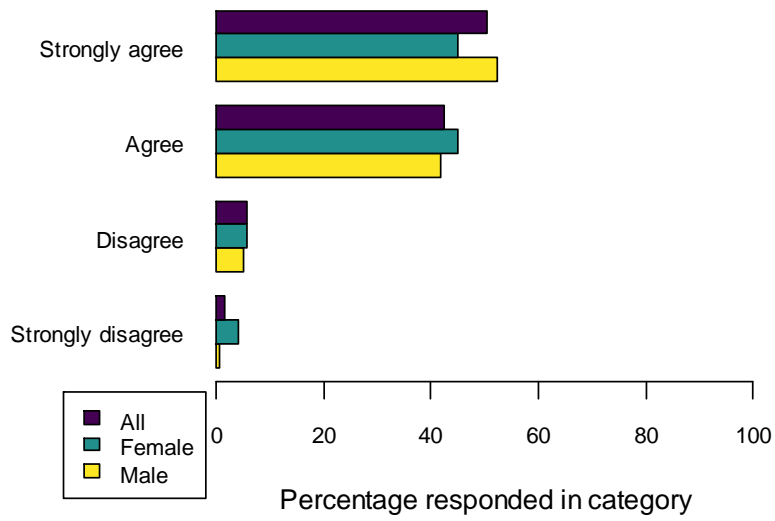
**4.6): In Anglo American South Africa, there is an equal number of men and women in Top management.**



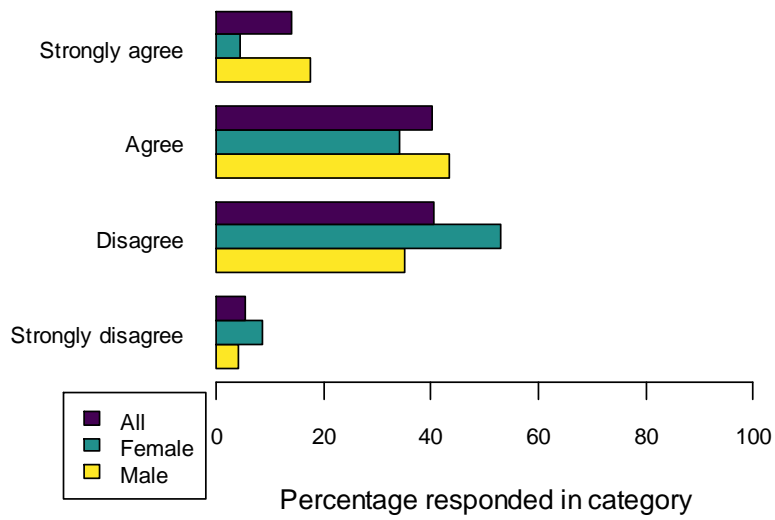
**4.7): In Anglo American South Africa, there is an equal number of men and women in Senior management.**



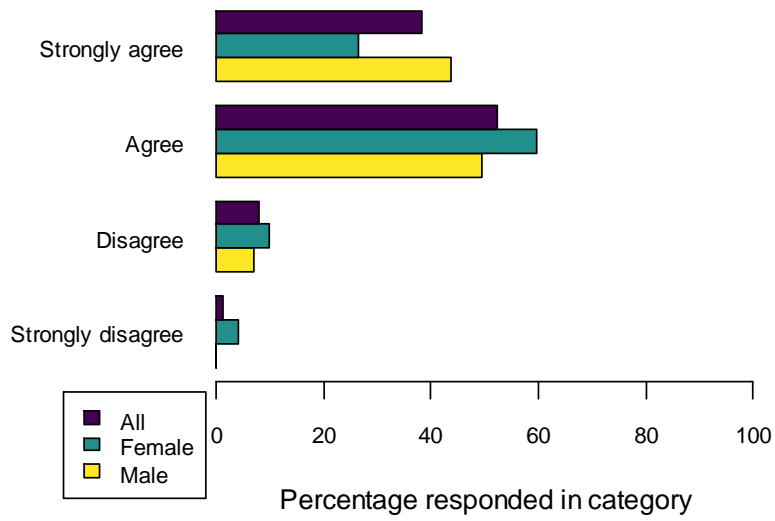
**5.1): My direct line manager supports women in our department.**



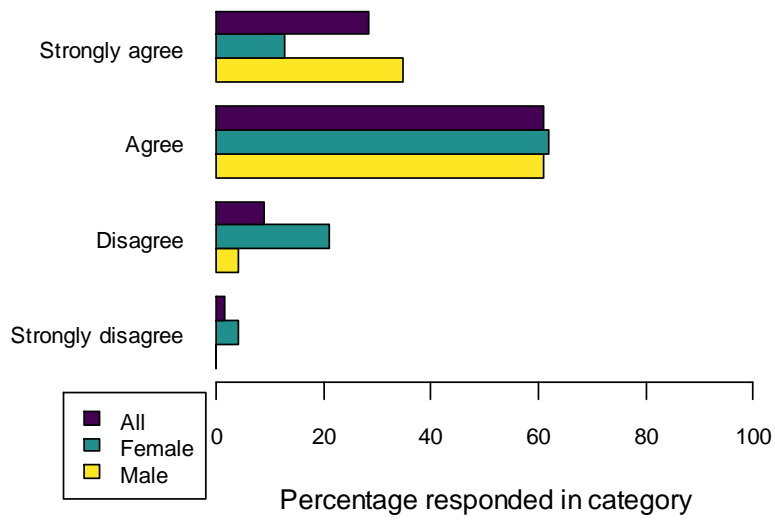
**5.2): In Anglo American South Africa, there are programmes that addresses the skills gap between women and men.**



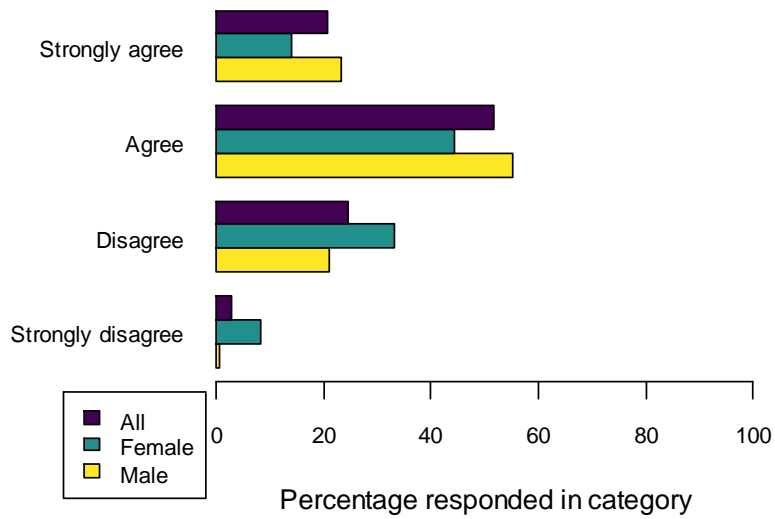
**5.3): In Anglo American South Africa, leadership supports the acquisition of new skills irrespective of gender.**



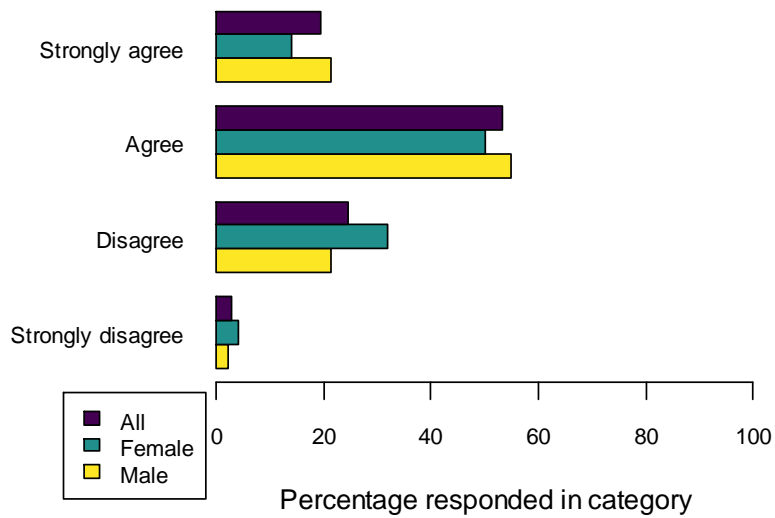
**5.4): In Anglo American South Africa, leadership involves women employees in decision making.**



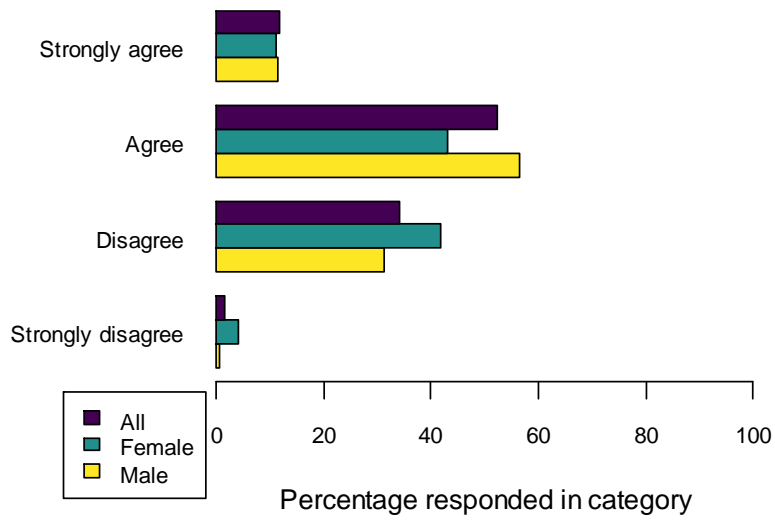
**5.5): My line manager and leadership keep track of women's career progression.**



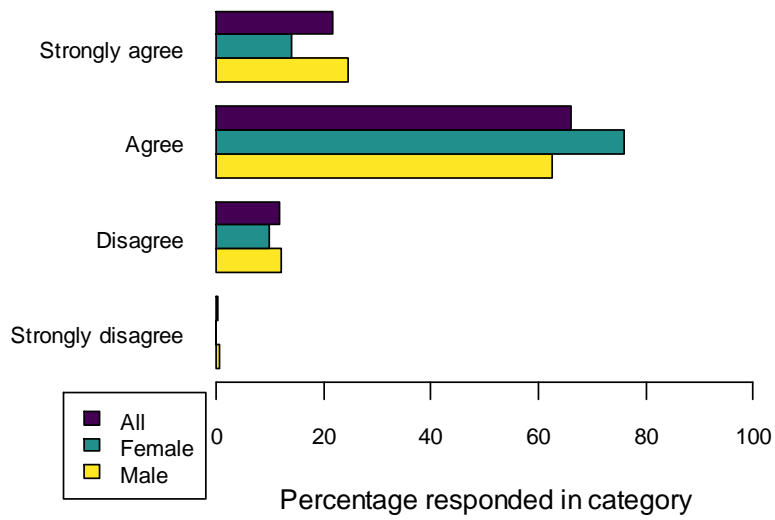
**6.1): In Anglo American South Africa, changes have been made to accommodate women. Example of changes: - Flexible working arrangements - Reasonable accommodation: lactation facilities, change rooms, language, culture etc.**



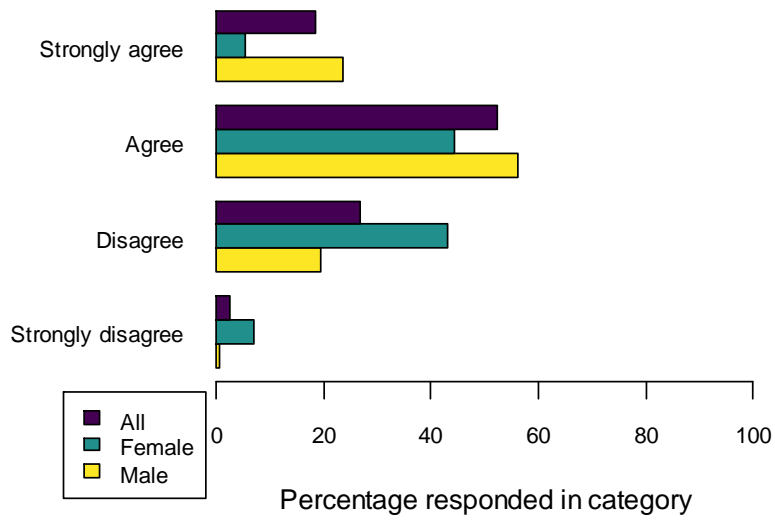
**6.2): I view the changes made to be effective.**



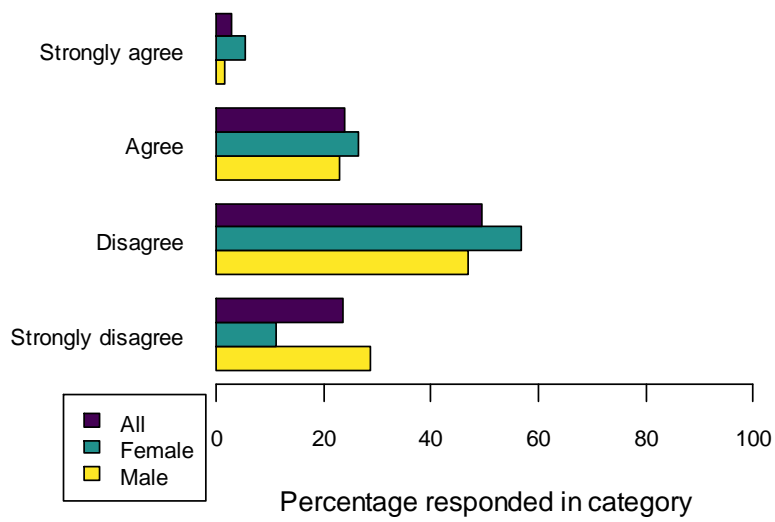
**6.3): In Anglo American South Africa, we have personal protective equipment that is specifically designed for women.**



**6.4): In Anglo American South Africa, women feel free to speak out.**



**6.5): In Anglo American South Africa, women are either harassed, bullied or victimised.**



## 9. Final thoughts

Please contact me should any further clarity be required.



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*Inspiring excellence.  
Transforming lives.*

*Inspireer uitnemendheid.  
Verander lewens.*

## Referencing the software

In case it is useful, I give the referencing guides from the software itself.

To cite R in publications use:

R Core Team (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.

A BibTeX entry for LaTeX users is

```
@Manual{, title = {R: A Language and Environment for Statistical Computing},  
author = {{R Core Team}}, organization = {R Foundation for Statistical Computing},  
address = {Vienna, Austria}, year = {2020}, url = {https://www.R-project.org/}, }
```

We have invested a lot of time and effort in creating R, please cite it when using it for data analysis. See also 'citation("pkgname")' for citing R packages.

Then I give the citations for the add-on packages I used. Use the parts that are relevant:

To cite corrplot in publications use:

Taiyun Wei and Viliam Simko (2017). R package "corrplot": Visualization of a Correlation Matrix (Version 0.84). Available from <https://github.com/taiyun/corrplot>

A BibTeX entry for LaTeX users is

```
@Manual{corrplot2017, title = {R package "corrplot": Visualization of a Correlation  
Matrix}, author = {Taiyun Wei and Viliam Simko}, year = {2017}, note = {(Version  
0.84)}, url = {https://github.com/taiyun/corrplot}, }
```

To cite package 'openxlsx' in publications use:

Philipp Schauburger and Alexander Walker (2020). openxlsx: Read, Write and Edit xlsx Files. R package version 4.1.5. <https://CRAN.R-project.org/package=openxlsx>

A BibTeX entry for LaTeX users is

```
@Manual{, title = {openxlsx: Read, Write and Edit xlsx Files}, author = {Philipp  
Schauberger and Alexander Walker}, year = {2020}, note = {R package version  
4.1.5}, url = {https://CRAN.R-project.org/package=openxlsx}, }
```

To cite package 'viridisLite' in publications use:

Simon Garnier (2018). viridisLite: Default Color Maps from 'matplotlib' (Lite Version). R package version 0.3.0. <https://CRAN.R-project.org/package=viridisLite>

A BibTeX entry for LaTeX users is

```
@Manual{, title = {viridisLite: Default Color Maps from 'matplotlib' (Lite Version)},  
author = {Simon Garnier}, year = {2018}, note = {R package version 0.3.0}, url =  
{https://CRAN.R-project.org/package=viridisLite}, }
```