THE SIMULTANEOUS IMPACTS OF GENDER, AGE, AND CULTURE: AN INTERSECTIONAL PERSPECTIVE ON BOTSWANA STEM LEADERSHIP

by

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ABSTRACT

The aim of this study was to investigate the impact of the intersection of gender, age, culture, and industry dynamics on the lived experiences of women in Botswana Science Technology, Engineering and Mathematics (STEM) leadership. The problem statement was inspired by the continued underrepresentation of women in STEM senior leadership positions and the paucity of local intersectional studies on the topic. Intersectionality was used as a key conceptual framework in this interpretivist qualitative study, creating meaning from the rich thick data from the interviews. The study recognised the contextual uniqueness of each participant's interpretation of her own experiences and acknowledged that that truth might not be generalisable, though transferable to similar contexts. Data were gathered through constructivist grounded theory semi-structured interviews. Twenty participants (19 in middle and senior management positions and 1 in a non-managerial position) were selected using purposive and snowball sampling techniques. The findings of the study showed that age, culture, and gender simultaneously impacted women leaders' experiences in the Botswana STEM sector. The broader socio-cultural context and STEM industry culture emerged as having the strongest impact on the women leaders' experiences of marginalisation. Specifically, a patriarchal societal culture and a masculine industry culture contributed to negative gendered experiences for women leaders. Age impacted the women leaders to a lesser degree, and its impact was more pronounced amongst younger women and older women leaders. Middle-aged women were transitorily spared, to an extent. While youth was associated with inexperience for both men and women, young women's age tended to be viewed more negatively. Similarly, while older age was cherished for men and associated with wisdom, it was shunned as a sign of decline for older women. The participants identified strategies for gender transformation at the individual, familial, industry, and societal levels. The study sought to address the paucity of intersectional studies in Botswana in general and the STEM sector in particular. The contribution of the study is an intersectional theoretical framework that addresses gender transformation in the STEM sector at the individual, organisational and national levels. The framework informs a holistic approach to gender transformation in the Botswana STEM sector. The limitations of the study, which future research can address, include the consideration of other social identities such as social class, sexual orientation and disability, and a broader cross section of STEM stakeholders.

Keywords: Age, bullying, Collusion, gender, intersectionality, gender transformation, Masculinity, national culture, outsiders within, STEM industry dynamics

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LIST OF ACRONYMS AND ABBREVIATIONS

AU:	African Union
HRDC:	Human Resource Development Council
LGBTQIA+:	Lesbians, Gays, Bisexuals, Transgender, Queer, Intersex, Asexual, etcetera
MDGs:	Millennium Development Goals
SADC:	Southern African Development Community
SDGs:	Sustainable Development Goals
STEM:	Science, Technology, Engineering and Mathematics
UN:	United Nations
UNDP:	United Nations Development Programme
WLB:	Work-Life Balance

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION AND ORIENTATION

Gender discrimination in the science, technology, engineering and mathematics (STEM) sector continues due to persistent deep-rooted cultural norms regarding gendered capabilities in the industry (Lewis, Hawthorne and Hodges, 2013; Dutta, 2018; STEM Women, 2020). Some of those who do enter the sector end up leaving for various reasons, creating a vacuum in intragroup role models (Miner, January, Dray & Carter-Sowell, 2019; Sterling, Thompson, Wang, Kusimo, Gilmartin & Sheppard, 2020). Very few of the women who join the sector make it to senior leadership positions (Dutta, 2018; Shein, 2018; McCullough, 2020). The STEM field started off as a male prerogative (Smith, 2013; Gray, O'Connor & O'Hagan, 2018; Smith-Doerr, Alegria, Husbands Fealing, Fitzpatrick, & Tomaskovic-Devey, 2019) bestowing upon it the reputation of being complex and tough (Wang & Degol, 2013; Blackburn, 2017; Degol & Wang, 2017) and as such, prestigious (Kyriakidou, 2012; McCullough, 2019; Lendák-Kabók, 2020). The sector continues to be regarded as masculine (Aeschlimann, Herzog & Makarova, 2016; Gray, O'Connor & O'Hagan, 2018; Lendák-Kabók, 2020), hence the few women who break into the field are pressured to tap into their masculinity for their abilities to be considered worthy of recognition (Cabay, Bernstein, Rivers, & Fabert 2018; Gray, O'Connor & O'Hagan, 2018). Over the years girls and women have broken the norm by not only enrolling in STEM subjects, but also excelling in them (Wang & Degol, 2013; Cabay et al., 2018). Unfortunately this academic success is yet to translate into women assuming senior and top leadership positions in the STEM employment sector (Carroll et al., 2014; Ash et al., 2016; Elbers & Grigore, 2018). Some of the women STEM graduates do not even enter the STEM workforce after having graduated, despite their outstanding academic performance (Wang & Degol, 2013; Bilimoria, Lord & Marinelli, 2014), because of social and structural factors (Dasgupta, Scircle & Hunsinger, 2015; Cabay et al., 2018).

While civilisation has more or less opened up to women's acceptance in the workplace, women in STEM are still made to feel inadequate and unwelcome (Donnelly et al., 2016; Cabay et al., 2018). A patriarchal broader social culture (Dutta, 2018; Lendák-Kabók, 2020) and the gendered nature of the STEM field (Hansen, 2020; McCullough, 2020) converge in women's lived experiences of leadership in the STEM domain (Amon, 2017; Ahuja & Weatherall, 2022). In the process, negative

gendered experiences are created, adversely affecting their career prospects in the field (Johnson, Widnall & Benya, 2018; McCullough, 2020).

Men, as a result, continue to dominate leadership positions in STEM (Saucerman & Vasquez, 2014; Dutta, 2018; Moss-Racusin, Sanzari, Caluori & Rabasco, 2018). This is principally because both STEM and leadership are culturally gendered in a way that advantages men (Adams et al., 2014; Rosette et al., 2016; Brown et al., 2017). Consequently, the world misses out on the unique expertise and perspectives that women could bring to their STEM fields, were they equally allowed on decision-making platforms (McCook, 2013; Sloan & Wajngurt, 2019). Failure to implement policies and strategies to address intersectional sociocultural factors that reinforce women's feelings of inadequacy adversely affects global progress (Robnett, 2016; Degol & Wang, 2017; Sloan & Wajngurt, 2019).

Despite an increasing number of women joining the STEM professions in and around the world (Robnett, 2016; Dutta, 2018), no studies to establish the reason for male domination in STEM leadership in Botswana could be located. The lack of knowledge on the lived experiences of those women who have either been or are still in STEM leadership creates uncertainty for aspiring young women who wish to pursue careers in the STEM sector, or women who are faced with "glass ceilings" (Tao, 2018: 629) or "sticky floors" (Davis & Sanchez-Hucles, 2010: 172).

Several studies have been conducted to understand why so few women occupy positions of leadership globally (Goian & Storozhuk, 2017; McCullough, 2020). Concepts such as women's invisibility (Hyman, Wilkins-Yel & Zounlome, 2019; Diehl, Stephenson, Dzubinski Wang, 2021), tokenism (Cabay et al., 2018; Still, 2020), glass ceilings (Victor & Shamila, 2018; Wolfert Rohde, V., Mielke, D. and Hernández-Durán, 2019) and glass cliffs (Krishnan & Szczepura, 2018; Dzubinski, Diehl & Taylor, 2019), which are associated with women's experiences in the workplace, encapsulate women's leadership experiences (Carter & Sims, 2019; Dzubinski, Diehl & Taylor, 2019). However, not enough studies have been conducted on the simultaneous impact of gender, culture, and age on the lived experiences of women in STEM leadership. While the intersection of gender and culture in STEM leadership has been investigated (Adams, Blodorn, Garcia, Hammer & O'Brien, 2014; Picho & Schmader, 2018; Corneille Lee, Allen, Cannady &

Guess, 2019), age was not brought into the equation. Most studies on age discrimination focus on the concerns of the ageing population and exclude the young generation (Thomas, Hardy, Cutcher, & Ainsworth, 2014; Lewis & Ryan, 2014). This has led young women to associate their negative lived experiences in the workplace with age and lack of experience, more than gender (Kelan, 2014). That is what motivated the inclusion of age as an identity in this study.

Few studies have been conducted on the gender gap in STEM leadership (Joseph, 2012; Aeschlimann & Herzog, 2016; Makarova, Kahn & Ginther, 2017), or how it is influenced by the intersection of women's subordinate social identities such as gender, culture, age, class, ethnicity, religion and sexuality. Most of the intersectional studies were conducted in the United States (Beil et al., 2010; Corneille et al., 2019), Europe (Catalyst, 2019; Fatourou, Papageorgiou & Petousi, 2019) and New Zealand (Pringle, Davies, Giddings & McGregor, 2017).

Furthermore, very few intersectional leadership studies have been conducted on the African continent, most in South Africa (Booysen & Nkomo, 2010; Dlamini, 2013; Moorosi, 2014; Mayer, Surtee & Mahadevan, 2018; Ncube, 2018), with a few in Nigeria (Dosekun, 2022; Okpokwasili, 2023). None of these studies focus on the STEM sector. Only three intersectional studies conducted were located in Botswana (Petitt, 2016; Horvoka, Alice & Must, 2019; Becker & Lund Schlamovitz, 2020) and these were not on organisational or STEM leadership.

1.2 BACKGROUND OF THE STUDY

Gender diversity has for decades been a popular topic in organisational practice and research, globally. The Fourth World Conference on Women in Beijing in 1995 called for an end to inequality between women and men. Specifically, the conference called for universal strategies to build women's capacity to take positions of leadership and decision making, and for their equal participation in structures of power (United Nations Department of Economic and Social Affairs, 2005). The world continues to struggle with gender inequality.

In the year 2000, the United Nations Development Programme (UNDP) together with its member countries, including Botswana, adopted the United Nations Millennium Development Goals (MDGs). The main objective of the MDGs was to reduce extreme poverty by, among others,

promoting gender equality and empowering women, as well as empowering the girl child through education (UNDP, 2001). While the question of the success of the MDGs is contested, (Lomazzi, Borisch, and Laaser, 2014; Fukuda-Parr, 2016), the fact that there were some noticeable shifts cannot be ignored (Yibeltal, Van Damme, Williams, and Hill, 2017; Larionova, 2020). The UNDP, together with the member countries resolved to adopt the Sustainable Development Goals (SDGs) as an improvement on the MGDs. While the MDGs were focused on developing countries such as Botswana, the SDGs encompass both developing and developed countries. The SDGs that advocate for equality focus on achieving gender equality and empowerment for women and girls, promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for both men, and women, as well as reducing inequality within and among different countries (UNDP, 2015). Any kind of injustice or inequality is always felt more by women than men. The emphasis on not only the primary concern, but its gendered impact by the SDGs is therefore very critical. The African culture believes that a woman is the pillar of a nation, and that by taking care of a woman, you are taking care of humanity. The (UNDP (2001:p3) agrees that "when society facilitates girls' empowerment through education, the eventual impact on their and their families' daily lives is unequalled." The report on the implementation of the MDGs shows that gender parity was achieved in primary schools in most of the participating countries. This study therefore argues that girls empowerment through education should be considered the gateway to a bright future, instead of a destination. In the same manner we see girls and young women excelling in STEM, we should be seeing them holding senior leadership positions resulting from equal opportunities, due to equal expectations on both men and women.

Gender equality has since been recognised as a human right by the Southern African intergovernmental regional block, Southern African Development Community (SADC, 2016), the African Union's Agenda 2063 (African Union Commission, 2015), as well as the United Nations 2030 Agenda for Sustainable Development (United Nations, 2016). Being a signatory of these organisations has influenced Botswana's gender equality discourse (Botswana Government, 2017; Mooketsane Molefe, Faiaz & Raj, 2023), notwithstanding the nonlinear trajectory in leadership equality (Modesto, Ongori, Agolla, Agolla, Van Lill, Sechele-Mosimanegape & Gumbo, 2016; Botlhale, 2020; Gender Links, 2020). Botswana's gender transformation journey is discussed later in this chapter.

In spite of all this, actual change in the workplace has been slow (Jourova, 2016; UNDP, 2016; O'Hea & Hoey, 2021). While some countries are doing very well, others are regressing (Jourova, 2016). Research shows that the percentage of women in senior leadership roles globally increased from 25% in 2017 to only 31% in 2021 (O'Hea & Hoey, 2021). Regionally, Africa had the highest gain at 39%, with Asia Pacific the lowest at 28% (O'Hea & Hoey, 2021). By September 2022, women held 58% of jobs in the USA, yet only 35% held senior leadership positions (McCain, 2022). Only 10.4 % of those women were CEOs in Fortune 500 companies (McCain, 2022). Women make up 50.6% of the population of Botswana (World Bank, 2022a). According to the World Bank, Botswana women held 59.2% of middle and senior management positions in 2022 (World Bank, 2022b). However, very few of them ascend to senior leadership positions (Economic Commision for Africa, 2012; World Economic Forum, 2019). According to Modesto et al, (2016), 32% of senior management positions in Botswana were held by women in 2015, increasing to 39% in 2016. More recent statistics could not be located.

The number of women in STEM occupations has also been increasing at a relatively acceptable rate through the years (Krishnan & Szczepura, 2018; Sterling et al., 2020). While women now make up 52% of the college-educated workforce in America, they only constitute 29% of the STEM workforce (National Scientific Foundation, 2019). Comparative statistics on Botswana STEM women were not readily available. Figure 1.1 below illustrates some of the statistics on women's participation in the Botswana STEM sector.

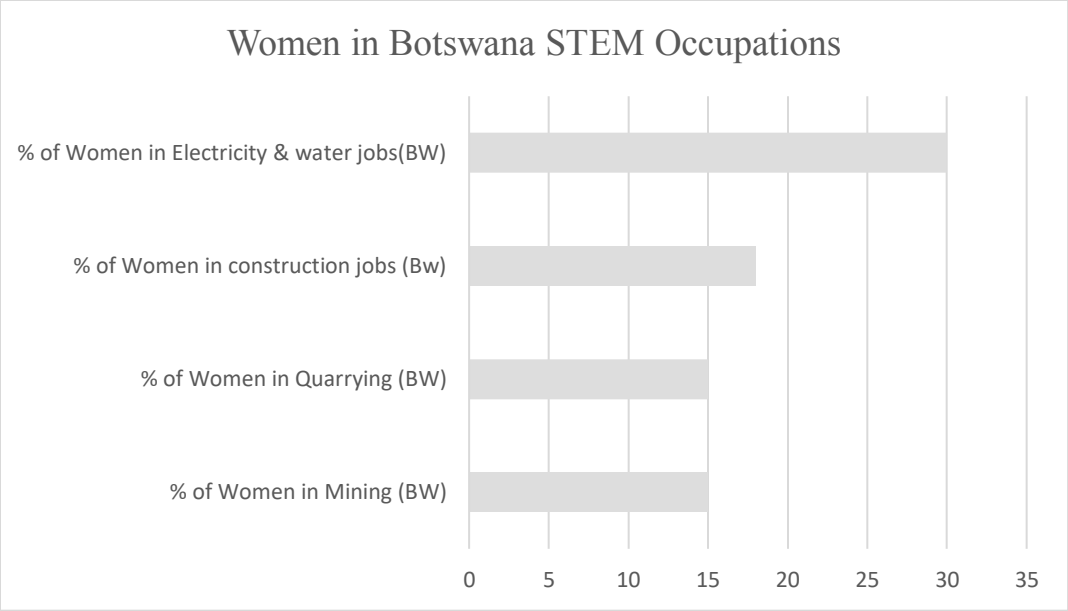

Figure 1. 1: Women in Botswana STEM Occupations (Statistics Botswana, 2018)

According to Statistics Botswana (2018), women were estimated to hold only 15% of mining and quarrying, 18% of construction and 30% of electricity and water jobs. The report did not reflect the levels the women operated at. These statistics underscore the gendered nature of STEM occupations and the need for Botswana to do much more to break the gender stereotypes and achieve gender parity in STEM employment and leadership (Denson & Jones, 2020).

The higher the levels of progression, the fewer the women (Robnett, 2016; Krishnan & Szczepura, 2018), with only 3% of them in CEO positions (Credit Suisse, 2016). As in other employment sectors, there are more women on STEM boards than are STEM CEOs (see Figure 1.2 below).

While some STEM fields such as medicine have reached gender parity (Hughes, Schilt, Gorman & Bratter,2017; Krishnan & Szczepura, 2018), the STEM leaky pipeline persists, more so in engineering (McCain, 2022), as women continue to feel unwelcome in STEM professions (Robnett, 2016). The masculine nature of STEM perpetuated by the sociocultural factors associating success in STEM with gender affects women's self-worth and perception (Degol & Wang, 2017; Hughes et al., 2017). Consequently, more women than men exit the STEM field due to the persistence of the dominant culture (Robnett, 2016; Hughes et al., 2017). Figure 1.2 below depicts the state of women in STEM globally.

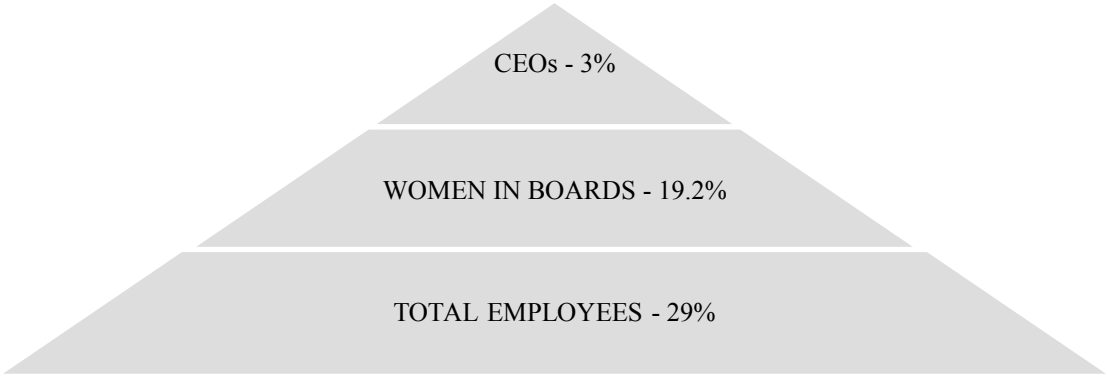

Figure 1. 2: Women in STEM occupations globally (BigRentz, 2021)

Figure 1.2 above shows that only 3% of chief executive officers in STEM occupations were women, while 19.2% were in boards, despite holding 29% of total global employment. The only African country included in the report was South Africa. Although Botswana was not part of the report, anecdotal data and inferences from the Statistics Botswana report indicate that Botswana probably did not fare better than the global performance.

1.2.1 Botswana's gender transformation journey

Botswana is a member of SADC. SADC Treaty Article 6(2) compels members to ensure gender equality through the prevention of gender-based discrimination. To achieve this, SADC adopted the SADC Protocol on Gender and Development in 2008, which Botswana only signed in 2017. This is despite the country being a member since the SADC inception in 1992, and serving as the host country (Southern African Development Community, 2017). The SADC gender protocol advocates, among other things, gender equality in education, to ensure that more girls take up STEM subjects across all levels, by addressing gender stereotypes. The girlchild remains marginalised as Botswana continues to struggle to improve gender equality in STEM education (Koketso, 2015; Denson & Jones, 2020). Table 1.1 below illustrates Botswana's performance in the Global Gender Gap Index in 2018 and in 2022.

Table 1. 1: Botswana's gender gap performance (Global Gender Gap Index, 2018 and 2022)

COUNTRY	2018 RANKINGS	2022 RANKINGS
Global Index	55	66
Economic participation and opportunity	13	7
Educational attainment	1	22
Health and survival	1	1
Political empowerment	126	129

Table 1.1 shows that in 2022 Botswana was ranked 66th globally and 14th regionally, out of 146 participating countries, in the Global Gender Gap Index (World Economic Forum, 2022). The four sub-indices measured were political empowerment, economic participation and opportunity, educational attainment, and health and survival. The country is farthest from gender parity in political empowerment and educational attainment, ranking 129th and 22nd respectively (World Economic Forum, 2022). This poor performance on gender parity in political empowerment negatively impacts gender transformation efforts in socioeconomic empowerment policy development (Botlhale, 2014, 2020; Mooketsane et al., 2023). On educational attainment, Botswana is not doing very well, despite free education being available to all citizens. Girls and boys do get equal opportunities to go to school, with 56.8% of females enrolled in tertiary education across all levels (HRDC, 2019). However, girls' empowerment through education should be the beginning of their journey instead of their destination, resulting in equal opportunities, even in leadership (Mooketsane et al., 2023). Information and communication technologies (ICT) and engineering, manufacturing and construction registered the highest gender gap globally. On economic participation, Botswana is at position 7 globally and position 3 in Africa. This includes the transformation of male-dominated employment sectors such as STEM. It is worth noting that women have been able to break in but have not been able to ascend to leadership positions.

1.2.2 Botswana policy environment

Botswana developed a National Policy on Gender and Development in 2015, "to guide and inform the development and implementation of gender sensitive and responsive initiatives by all" (National Policy on Gender and Development, 2015:1). The National Policy on Gender and

Development was intended to enable the country to fulfil its UN, AU, and SADC gender transformation obligations. Areas prioritised by the National Policy on Gender and Development are:

1. Advocate gender equality in Botswana.
2. Create and strengthen an enabling and supportive environment for an effective national gender response.
3. Adopt and apply affirmative measures as necessary, to address identified gender gaps.
4. Provide guidance on gender mainstreaming to all sectors, that is, public and private sectors and civil society organisations.
5. Advocate and support strengthening of national capacity for gender mainstreaming in sector policies, programmes, and operations.

Despite the establishment of the National Gender Commission to monitor implementation of the policy, there is still little known about the policy.

Botswana's National Vision 2036 advocates gender equality, including in policy development. The National Development Plan 11 also advocates gender mainstreaming. Government started a capacity building project for women assuming leadership positions in public service in 2016 (Botswana Government, 2017).

1.3 RESEARCH PROBLEM

Despite a significant increase in the number of women who join the STEM employment sector in Botswana, women remain underrepresented in senior leadership positions in the sector. While the country has introduced gender transformation policies aimed at correcting the prevailing situation, these efforts have not translated into meaningful representation of women in senior leadership positions in the sector. Excluding women from leadership positions not only perpetuates gender inequality but also robs the country of sorely needed talent.

While there is a growing body of knowledge on women in STEM leadership, there is a paucity of intersectional studies on the topic, and none could be located on Botswana STEM leadership. This qualitative study used the intersectional lens and constructivist grounded theory to investigate the

lived experiences of women leaders in Botswana STEM leadership. The findings of this study stand to inform personal and organisational practices, as well as public policy, towards meaningful gender transformation in the Botswana STEM field.

1.4 AIMS AND OBJECTIVES OF THE STUDY

This study sought to build on the nascent body of intersectional leadership research in Africa and STEM leadership in particular. Specifically, the study explored how the intersection of gender, age, national culture, and STEM industry dynamics impacted women's lived experiences in STEM leadership. The specific objectives of this study were to:

1. Investigate the effects of the intersection of age, culture, and gender in the working lives of women in the Botswana STEM leadership.
2. Examine how STEM industry dynamics systematically impact women in Botswana STEM leadership.
3. Explore the reasons for continued male dominance in Botswana STEM leadership.
4. Identify strategies for gender transformation in Botswana STEM leadership.
5. Develop a conceptual framework for gender transformation in STEM leadership.

1.5 RESEARCH QUESTIONS

While the study had five research objectives there were only four research questions, as objective 5 derived from the data from the first four objectives spoke to the development of a conceptual framework. The study sought to answer the following research questions:

1. How does the convergence of age, culture, and gender manifest in the lived experiences of women in STEM leadership in Botswana?
2. How do industry dynamics systematically impact women in STEM leadership in Botswana?
3. What factors contribute to the continued dominance of men in Botswana STEM leadership?
4. What strategies can be put in place to improve gender transformation in STEM leadership in Botswana?

1.6 SIGNIFICANCE OF THE RESEARCH

The empowerment of women and children is a phenomenon that has been discussed for a long time globally, regionally, and locally in Botswana. Current practice, however, does not seem to

match the efforts. This study brings to light yet another dimension of empowerment and provokes dialogue on what needs to be done to achieve long-lasting and far-reaching change in society.

The few studies on the gender gap in STEM leadership (Joseph, 2012; Aeschlimann & Herzog, 2016; Makarova et al., 2017) did not research the impact of the intersection of women's subordinate social identities such as gender, culture, age, class, ethnicity, religion and sexuality. Most of the intersectional studies were conducted in the Western world (Adams et al., 2014; Tao, 2018; Corneille et al., 2019), with none coming out of the African continent.

Furthermore, not enough studies have been conducted on the intersectionality of gender, culture, and age in the lived experiences of women in STEM leadership. There are studies that have analysed the intersection of gender and culture in STEM leadership (Adams et al., 2014; Picho & Schmader, 2018; Corneille et al., 2019), but not age. Most studies on age discrimination focus on the concerns of the ageing population and exclude the young generation (Thomas et al., 2014; Lewis & Ryan, 2014). No studies on women's intersectionality in STEM leadership based on the African continent were located. This study therefore intended to start that conversation. This gap in knowledge perpetuates the gender inequality in STEM leadership.

1.7 DELIMITATIONS OF THE STUDY

The scope of this study was current and past women leaders in the Botswana STEM sector. This included women in middle management and in executive management positions. Women in middle management were included because they were expected to account for a greater share of the general population of women STEM leaders. Furthermore, their experiences were vital to the trustworthiness of the study since research shows that women generally struggle to advance beyond middle management. Women who exited STEM employment at senior leadership level were included in the sample to capture the standpoints of those that could not stay. Women in non-leadership positions were initially not included in the study due to the likelihood of limited experiences and employment in the STEM sector. However, one was theoretically added in response to an emerging concept of women's denialism.

1.8 CRITICAL SELF-REFLECTION AND POSITIONALITY

I was born and raised in a small mining town called Selebi-Phikwe in Botswana. My mother worked as a nurse away from home from when I was six years old until I left home for boarding high school and subsequently university. I can therefore safely claim that I, as the first-born child, co-parented my two siblings and two cousins who came to live with us with my father. Little did I know that I was learning leadership and fearlessness.

Growing up with connections to two distinct ways of life – my urban life with my immediate family as well as my rural life with my extended family – exposed me to the slight variations of my social culture. Differences between women and men were not as pronounced in town as they were in the village. In my early twenties I attended a funeral in my home village. Because we had arrived early, we were able to secure chairs, most of which were quickly occupied. Suddenly it was announced that all women had to vacate their seats and give them to the men who were standing. The women were told to sit on the floor as it was considered uncultured for women to be sitting on chairs while men were standing. I was accompanied by two aunts who refused to obey the instruction and as all other women moved to the floor, we remained perched on our chairs with the men.

I graduated with a degree in Design and Technology from the University of Botswana in 1999, from a class of thirteen male and 3 female students, me included. After having graduated I taught Design and Technology in four different secondary schools around Botswana for ten years. Due to the nature of the subject I taught, my students were predominantly male. Naturally, these were highly energetic students in their mid to late teens. Not only was I able to maintain good class control, but I was also able to produce good results, for boys and girls alike.

However, after ten years of teaching, a job I truly loved, I moved to a completely different field of employment unrelated to STEM. My primary reason for leaving was the lack of progression opportunities, with no clear prospects of improvement. I decided to leave as opportunities looked more promising in other sectors, and I have never left looked back.

The fact that I left the STEM domain to pursue an unrelated field could influence the study by reflecting my personal experiences and assumptions. The engagements with the participants brought back memories from my days as a STEM professional, some of which were not so pleasant. I however relied on constructivist grounded theory rigor to ensure the credibility and trustworthiness of the study.

1.9 DEFINITION OF KEY CONCEPTS

The working definitions of the concepts used in the study are presented below.

1.9.1 Intersectionality

Intersectionality is defined as a theoretical approach that simultaneously considers multiple social identities and their disadvantages, such as gender, race, social class, sexual orientation, disability and religion (Harackiewicz, Canning, Tibbetts, Priniski & Hyde, 2016). It can also be defined as a theory which highlights the complexity in the interaction of multiple social categories to influence an array of individual outcomes (Loignon & Woehr, 2017). Intersectionality is a theory that underscores the importance and understanding of the interconnectedness of multiple social identities such as race, ethnicity and class (Hoobler, Masterson, Michel & Nkomo, 2018). Gouws (2018) defines it as the interlocking relations of dominance of multiple social, political, cultural, and economic dynamics of power that are determined simultaneously by identity categories such as race, gender, class, sexuality, disability, and others. Lastly, Crenshaw (2016) defines intersectionality as

> *what occurs when a woman from a minority group . . . tries to navigate the main crossing in the city. . . The main highway is 'racism road'. One cross street can be Colonialism, then Patriarchy Street. . .She has to deal not only with one form of oppression but with all forms, those named as road signs, which link together to make a double, a triple, multiple, a many layered blanket of oppression.*

The common theme in all these definitions is the multiplicity of marginalisation due to the convergence of subordinate social identities.

1.9.2 Gender

Gender is defined as "the social conceptualisation of males and females based on social differences and relations between them that are learnt, changeable over time, and have wide variations across cultures. The term gender is used to distinguish the socially constructed from the biologically determined aspects of being male and female" (Ministry of Labour and Home Affairs Gender Affairs Department, 2015:7). According to Seguino (2016: 9), gender is "a primary marker of social and economic stratification, and as a result, exclusion."

There are, however, individuals who identify as neither male nor female and are referred to as non-binary gender (National Centre for Transgender Equality, 2023).

This study uses the binary definition of gender, which is aligned to the historic definition of gender as male and female, according to one's sex assigned at birth (DuBois and Shattuck-Heidorn, 2021). This is problematic in itself as it caters to the problematic culture being researched, which is consequential to yet another marginalised group.

1.9.3 Culture

Culture refers to a collective of customs, norms, traditions, beliefs, and social behaviour that is common to a group of people. It is defined by the way people do things, as well as the values that define them (Kitirattarkarn, Araujo & Neijens, 2019). Culture defines people and their way of life. It assigns clear roles depending on social positions deemed important by that culture (Cionea, Liu & Zhu, 2019). It is the common way people do things as well as the values that define them. Developed over extensive periods of time, through generations (Nash & Patel, 2019), culture is commonly referred to as "the way we do things around here" (Abdul-Halim, Ahmad, Geare & Ramayah, 2019). Cultures "result from the internal and external changes experienced by the group (the functionality perspective) and from a group leader's personal values and personality traits (the leader–trait perspective)" (Kim & Toh, 2019).

What is common to the different definitions of culture is that they involve the way a group of people, either as a community, industry, or organisation, conducts its business, and that is how this study regarded it.

1.9.4 Age

Age is defined as "the time metric used most frequently to indicate individuals' standing in the life span." (Kotter-Gruhn, Kornadt, Stephen, 2015:p1). Weiss and Lang (2012) define age in terms of groups or generations, calling it "the two faces of age identity" (p2).

The first definition of age is the one that was used for the purposes of this study as it aligns with how age is defined within the Botswana system. The United Nations considers youth to be from fifteen to twenty-four years of age, but Botswana defines youths as those up to the age of thirty-five. This study used the Botswana definition of age.

1.9.5 Leadership

Kaiser, Mcginnis and Overfield (2012) define leadership as "a social influence process in which leaders use interpersonal behaviours to motivate followers to contribute to group goals." Similarly, (Lee, 2019) says "a set of personal attributes and a collection of human behaviours, leading is a complex combination of human qualities and actions." According to Hogan and Kaiser (2005) the most important role of leadership is to ensure synergistic effort towards organisational success. Lee (2019) concurs that the primary role of a leadership is to motivate followers to voluntarily work towards achieving organisational goals. The above definitions emphasise the leader's responsibility in ensuring organisational success through their ability to cultivate a shared vision between themselves and their followers. Lee (2019 however acknowledges the influence both social and organisational culture have on leadership.

At a cognitive level these definitions of leadership make sense. However, As pointed out by various scholars, (Atewologun, Bebbington & Showunmi, 2016; Blackburn, 2017; Miner et al., 2019; O'Connell & McKinnon, 2021), they fail to speak to the gendered, racialised, and classed reality of organisational spaces. They also do not take sufficient account of local nuances including local socio-cultural landscapes, particularly in the global South (Moswete and Lacy, 2015; Dosekun, 2022). This thesis analyses the ability of women in Botswana STEM leadership to execute their leadership roles, and how that is impacted by their age, gender, and race.

1.10 STRUCTURE OF THE THESIS

This thesis is made up of six chapters. Chapter 1 contextualises the study by giving the background, research problem, aims and objectives of the study and setting out the research questions, significance of the study, critical self-reflection, positionality, delimitations of the study and definition of key concepts.

Chapter 2 discusses intersectionality as the key conceptual framework used in this study. It defines intersectionality and explains its origins as a theory associated with women's marginalisation. The chapter concludes by discussing contestations over intersectionality.

Chapter 3 discusses literature on women in leadership, including women in STEM leadership, as well as the challenges the women experience. The chapter explores intersectionality and its use globally, including in Botswana, in STEM leadership. The chapter then discusses literature on women's intersectional experiences as STEM leaders.

Chapter 4 presents the research methodology of the study and includes the research philosophy, approach, methodological choice, history, and justification for the version of grounded theory research design used in the study. The chapter also discusses the research time horizon as well as data collection and analysis techniques and procedures, including strategies applied to ensure credibility and trustworthiness of the study.

Chapter 5 presents the research findings in the words of the participants, with the discussion drawing from literature related to the topic. The chapter further presents strategies proposed by the participants for STEM gender transformation. The chapter concludes by presenting the conceptual framework that derives from the findings of the study.

Chapter 6 presents the conclusions of the study in relation to the purpose of the study, the findings of the study, the contribution of the study, the limitations of the study and suggestions for future research. The chapter concludes with my final thoughts and reflections on the research journey.

1.11 CONCLUSION

This chapter introduced the study by highlighting the plight of women in the workplace, both nationally and globally. It underscored the need for research on the intersectionality of women's experiences in STEM leadership in Botswana, drawing from slow global efforts aimed at changing the status quo. The chapter briefly discussed Botswana's gender transformation efforts through the years. Furthermore, the chapter explained the significance of the study and the broader implications of the impact of the convergence of women's subordinate identities on gender transformation and women empowerment in STEM employment. My personal investment in the study as the researcher was communicated through self-reflection and positioning. The chapter concluded with a definition of key concepts in the study.

The next chapter discusses intersectionality as a key conceptual framework and its ability to address women's experiences of marginalisation due to their multiple subordinate identities.

CHAPTER 2: KEY CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

This chapter introduces intersectionality as the key conceptual framework used by this study to analyse women's experiences with a view to the development of a STEM gender equality conceptual framework. The discussion is limited to unpacking intersectionality as a lens, its history, and its significance to gender studies. The chapter starts by defining intersectionality, explaining its origins as a legal theory used to study black women's discrimination due to their minority status. It then highlights the importance of having the support and interest of those who belong to the privileged groups in efforts towards equality. The chapter also points out ways in which intersectionality was always used in discussions of marginalisation even before being coined as a term by Crenshaw. The chapter concludes by acknowledging criticisms that intersectionality has been subject to.

2.2 A Prelude to Intersectionality

To appreciate intersectionality requires an understanding of the history of feminism (Brewer, 2012). At the beginning of civilisation when the world was being organised through the promulgation of laws, it was pronounced that women were the inferior of the two genders, as human rights were sex specific, excluding women (Wollstonecraft, 1792). That provoked the beginning of feminism, with different generations identifying critical bases of gender-based discrimination to advocate gender equality. The first wave feminist movement, or suffrage movement, advocated women's rights to education, citizenship, voting, custody, and the abolishing of slavery, among other things (Wrye, 2009).

As one generation feels it has made strides and feels disconnected from the feminism movement, another generation is energised through feelings of disenfranchisement and anger (Schrof, 1993; Snyder, 2008). By the end of the world wars, second wave feminism started, with more black and other ethnic minority feminist voices (Roth, 2003). The second wave movement focused on racial and gender-based discrimination (Roth, 2003; Baxandall & Gordon, 2005, 2013). Third wave feminists took over in the mid-1990s with the belief that more needed to be done, focusing on inclusivity and recognising more social identities (Snyder, 2008; Brunell, 2018). This led to the

addition of more social identities, such as lesbians, gays, bisexuals, transgender, queer, intersex, asexual (LGBTQIA), body positivity, differently abled and any other social difference (Brunell & Elinor, 2019) alongside intersectionality, during the fourth wave.

Most of the intersectionality studies understandably focus on feminism, as it is the original context within which the global fight against women's social and professional disenfranchisement was advanced (Cho, Crenshaw & McCall, 2013; Carastathis, 2014; Gouws, 2018). As intersectionality continues to recognise more subordinate social identities, studies have also been done on the lived experiences of the LGBTQIA (or LGBTQ+) community (Meer & Müller, 2017; Rothmann, 2018), as well as on educational leadership across all levels (O'Bannon et al., 2010; Moorosi, 2014).

2.3 INTERSECTIONALITY EXPLAINED

Intersectionality is a term coined by African American feminist and scholar, Kimberley Crenshaw (1989), in her quest to shine the light on the complex nature of injustices experienced by African American women due to the multiplicity of their social identities. It is a concept that was initially invented to define the simultaneity of different social identities such as race, class and gender in the lives of African American women (Crenshaw, 1989). However, subsequent studies have identified many more social identities that converge in the lives of women, creating an axis of power that works against them (Yuval-Davis, 2006; Cho, Williams, Crenshaw & McCall, 2013, Carastathis, 2014). These include nation (Abdulrahim, Miranda & Viruell-Fuentes, 2012; Corus & Saatcioglu, 2015), age (Hameed, 2018), sexuality (Walker & Nicole Melton, 2015; Breslin, Pandey & Riccucci, 2017; Hollis, 2018) and religion (Choo & Ferree, 2010; La Barbera, 2017), among others.

The convergence or intersection of Black women's social identities has been studied in both their social and professional lives as it influences their lived experiences in every aspect of their lives (Harris, 2017). Intersectionality underscores the fact that while White women share gender discrimination with Black women, they have the privilege of race. Relatedly, while Black men are also discriminated against on the basis of race, they have the privilege of gender, which lack women do not have (La Barbera, 2017; Ndinda & Ndhlovu, 2023). This places Black women at the bottom of the social ladder (Lewis, 2013; Yamaguchi & Burge, 2019). In an attempt to

demonstrate the intersectionality of women's subordinate social identities, Crenshaw (1989) problematises "the narrow scope of antidiscrimination doctrine" and "the centrality of White female experiences in the conceptualization of gender discrimination" (Crenshaw, 1989: 144). Cho, Crenshaw and McCall (2013) highlight colour blindness which prompts the invisibility of White privilege, and results in the disadvantaging of Black people. Put differently, failure to recognise the race privilege that White women have, over other women, puts the latter group of women at a disadvantage as their subordinate race becomes a negative factor in their experiences.

When it comes to other races, men's experiences are considered universal in the conceptualisation of racial oppression, leaving out the experiences of women across social identities (Yuval-Davis, 2006; Bilge, 2014). As a result, Black women struggle with the convergence of their multiple social identities of oppression, which long pre-date the term intersectionality (Crenshaw, 1991; Carastathis, 2014). Collins (1986) talks about interlocking oppressions in the lived experiences of a woman, which is a perfect definition of intersectionality. The reality is that each woman experiences oppression differently, due to her personal experiences and individual history and background, among other things (Collins, 1986; Gray, 2018). This is, therefore, a conversation that will not end. There is a continued emergence of related but different lived experiences of oppression by different groups of women.

Intersectionality is now commonly used as a theory in the study of gender equality across fields of learning and across nations, in order to influence change through better understanding of subordinate social identities (Luft & Ward, 2009; Dy, Marlow & Martin, 2017). It is used qualitatively to seek better understanding of women's lived experiences at the intersection of their subordinate social identities (Carbado, Crenshaw, Mays & Tomlinson, 2013; Atewologun, Sealy & Vinnicombe, 2016). Intersectionality was used in this study as a theoretical lens to unpack the lived experiences of women in STEM leadership in Botswana, at the intersection of gender, culture, and age.

2.4 INTERSECTIONALITY DEFINED

Crenshaw defines intersectionality as the simultaneous impact from multiple sources experienced by subjects of subordinate social identity (Crenshaw, 2016). To elucidate how the simultaneous

impact occurs, she metaphorically analyses the Degraffenreid v General Motors case from Crenshaw (1989):

> *The roads to the intersection would be the way that the workforce was structured by race and by gender … the traffic in those roads would be the hiring policies and the other policies that ran through those roads … Because Emma was both Black and female, she was positioned precisely where those roads overlapped, experiencing the simultaneous impact of the company's race and gender traffic. The law is like that ambulance that shows up and is ready to treat Emma, only if it can be shown that she was harmed on the race road or on the gender road but not where those roads intersected.*
>
> (Crenshaw, 2016)

Crenshaw (1989) used the term intersectionality in an effort to explicate the peculiarity of the experiences of Black women due to their subordinate social identities. She took inspiration from a feminist anthology in Black Women's Studies titled "All the Women are White, All the Blacks are Men, But some of us are Brave" (Bell-Scott, Hull & Smith, 1982). Inspired by Black women's life experiences, Crenshaw's argument was that the only recognised racial and gender discrimination was through the experiences of Black men and White women, thereby systematically excluding Black women. She added the privilege of class, which seemed exclusive to White women who were either employed or had husbands with good jobs to take care of them – or both. Most Black women were underprivileged compared to Black men who had better job opportunities; they also formed a second class after White women, because of their race. Such dynamics, according to Crenshaw, rendered black women invisible. They ignored the fact that they experienced racial and gender discrimination simultaneously, requiring targeted efforts.

2.5 BLACK WOMEN'S LIVED EXPERIENCES PRE-INTERSECTIONALITY

Although the coining of the term intersectionality is attributed to Crenshaw's (1989) seminal paper, an intersectional approach to Black women's challenges can be traced back to Sojourner Truth's "Ain't I a Woman" speech given in 1851. Truth (1851) challenged the inconsistent definitions of "woman" along racial lines, where designated female privileges were exclusively enjoyed by White women to the exclusion of Black women, systematically erasing the latter. Shirley Chisholm, the first woman and first Black person to run for party nomination for the United

States President in 1972, was considered an intersectional feminist (Curwood, 2014), despite being active in political leadership from 1968-1985. her advocacy was on race, gender, and class, pre-intersectionality.

The questioning of the inconsistent treatment of Black and White women by Truth (1851) and Chisholm (Curwood, 2014) is an illustration of the racialised social definition of race, gender and class, which Crenshaw (1989) named intersectionality. Three years before Crenshaw's paper, Collins (1986) referred to the interlocking nature of race, gender, and class oppression", to emphasise the significance of Black feminism (Collins, 1986: 19). Similarly, Dressel (1988), in an attempt to underscore the same convergence of women's social identities in influencing poverty, refers to the interlocking of the same identity categories as Collins. Both Collins and Dressel argue against the single axis framing of discrimination, which mostly references Black men or White women and excludes the peculiarity of Black women's lived experiences. These studies followed in the footsteps of the Combahee River Collective (1974: 6) which also referred to the interlocking systems of oppression resulting from a "multi-layered texture of Black women's lives". In the same vein, the Combahee River Collective (1974: 1) argued for Black feminism as a "logical political movement to combat the manifold and simultaneous oppressions that all women of colour face".

Glenn (1985), in her study titled Racial Ethnic Women's Labour: The Intersection of Race, Gender and Class Oppression, recognises other ethnic minority scholars, namely Bonnie Dill, Cheryl Gilkes, Elizabeth Higginbotham and Ruth Zambrana. These female ethnic minority scholars recognised the convergence of ethnic minority women's social identities, which Crenshaw later named intersectionality. Intersectionality as a term may, therefore, have been introduced by Crenshaw (1989). However, it is quite evident that studies on the converging nature of Black and ethnic minority women's lives have always existed, albeit by some other name. Crenshaw (1989) therefore continues the argument for an intersectional approach to feminist politics and antiracist advocacy to cater for the diversity of gendered and racialised groups from a Black feminist point of view, naming it intersectionality.

Glenn (1985: 87) decries the failure of feminism to address the convergence of race, gender and sometimes class in ethnic minority women's lives in the workplace, calling it a "double or triple

oppression". The study advocates the development of a theoretical framework to analyse ethnic minority women's intersectional life experiences. Although it acknowledges the availability of the patriarchy model as well as the internal colonialism model, it dismisses them as inadequately addressing the peculiarity of Black women's experiences. In the same vein, Hartmann and Markusen's (1980) criticism of contemporary Marxist theory exemplifies White feminism's exclusion of Black women's racialised experiences. It argues against the theory's patriarchal nature, advocating a strategy that would resolve gender discrimination, and consequently class, without mentioning race. The subsequent introduction of Crenshaw's intersectionality framework is, therefore, an indirect response to Glenn's (1985) wishes as it provides a conceptual framework for Black feminism studies to achieve the inclusion of Black women's converging social identities. Crenshaw's application of intersectionality to ethnic minority women's organisational as well as social experiences (1989) builds a strong case for intersectionality as a Black feminist theory. As Collins (1986) posits, only Black women can best tell the stories of their lived experiences as they are the ones experiencing it, individually or as a group, which is what intersectionality studies provide an opportunity for.

Crenshaw (1989, 1991) elucidates White feminism's failure, which Glenn (1985) attributes to colonial history where the two groups of women experienced life differently as the oppressed and the oppressors; White feminism only captured women's experiences that excluded ethnic minority women's (Aptheker, 1981). White women's patriarchal experience was joyful as it was glorified by the importance associated with motherhood as crucial to society's development, across all classes (Dill, 1988). On the contrary, Black women's role of motherhood was painful as it was associated with slavery, with their reproductivity associated with the expansion of the workforce for their slave masters, in the process affirming and solidifying their position as a means to an end (Truth, 1851). Some of the mothers killed their babies in an effort to protect them from the demeaning life of slavery (Dill, 1988). Dill (1988) captures the clear distinction between the two groups of women, explaining the diversity of their pain points in feminism and in the process accentuating the significance of intersectionality as a conceptual framework for Black feminism.

2.6 ALLYSHIP IN FEMINISM

Kim and Meister (2022: 11) recognise the benefit of what they call "allyship behaviour" when some members of the dominant group provide support to the oppressed minority. Some White feminists such as Aptheker (1981) and Wriggins (1983) epitomised allyship in feminism in their acknowledgement of the peculiarity of Black women's lived experiences. Aptheker (1981: 13) defines feminism as "the empowerment of women", where gender equality means the emancipation of Black people, both racially and culturally. If feminism remains synonymous with whiteness, with Black women and their unique experiences systemically excluded from feminist discussions, then gender equality will remain an illusion. The convergence of ethnic minority women's social identities dictates the way they experience life, and gender equality depends on giving attention to their issues as well. Wriggins (1983: 118) concurs, arguing that the denial of Black women's rape dates back to slavery when White men had "institutionalised access" to Black women based on their subordinate race and class. Caraway (1991), another White feminist, underscores the importance of inclusive feminism, advocating associating with, learning from, and obtaining a deep understanding of ethnic minority women, a change that intersectionality introduced.

Aptheker (1981) expresses her dissatisfaction with White women's oblivion to Black women's studies, a clear illustration of lack of interest on their part. Their preference for Whites only feminist activities was, according to Aptheker, a clear indication of their reluctance to let go of their privilege. Failure by White feminism to engage with Black women disqualifies its attempts to advocate for Black women in gender discrimination as attempts to advocate for something not understood could be expected to be deficient. All these White female scholars acknowledge the intersection of Black women's social identities in an attempt to highlight the differences in the way Black women experience their lives versus White women and Black men. None of these studies call intersectionality by name, but they all describe it in the way they describe the Black women's lived experiences.

2.7 MULTICULTURALISM IN DIVERSITY

Caraway (1991) argues for the recognition of women's multiculturalism and admits the richness of Black feminism as it allows ethnic minority women to personally share their experiences.

Caraway (1991) therefore arguably affirms the importance of intersectionality, though indirectly, as its primary purpose is to provide a vehicle for Black feminist voices, compelling White feminists to recognise the existence of racialised gender discrimination. Just like intersectionality, Caraway's multiculturalism advocates the recognition of people's diversity stemming from their social identities such as race, nationality and religion (Colombo, 2014; Gray, 2018). Similarly, intersectionality as a Black feminist theory focuses on the multiculturalism of Black and other ethnic minority women (Armstrong, Strid & Walby, 2012; Atewologun, Sealy & Vinnicombe, 2016).

Aptheker (1981) highlights the influence of sexuality on individuals' lived experiences, acknowledging the complexities and dilemmas flowing from the social identity of Black women's lives during those times. This further demonstrates the complexity of Black women's intersectional, interlocking or converging social identities which intersectionality endeavours to clarify. While the diversity of sexuality has generally gained political acceptance, it continues to be a barrier in individuals' lives due to societal counter attitudes. In her sophomore paper on intersectionality, Crenshaw (1991) similarly expands intersectionality's applicability beyond race and gender. Crenshaw (1991) embraces the complexity of ethnic minority women's lived experiences as the study unfolds. The focus of the study – initially on women of colour – progresses to include immigrants, like Asian women, as ethnic minorities also found in America, adding subordinate social identities burdening ethnic minority women in the form of nationality, language, and culture (Crenshaw, 1991) and thus recognising the diversity of individuals' social identity due to their multiculturalism.

2.8 BLACK WOMEN'S INTERSECTIONAL INVISIBILITY

Crenshaw (1991) illustrates ethnic minority women's intersectionality as social beings in addition to their organisational lives. Crenshaw (1989) analyses the handling of rape cases to illustrate the marginalisation of ethnic minority women, in comparison to white women, with reference to both Black and White men. While Black men convicted of raping White women got harsher sentences than White men convicted of similar charges, both Black and White men accused of raping Black women got lenient sentences, with no conviction at all in some cases (Wriggins, 1983). Crenshaw argues that race plays a central role in juries' conviction decisions. She gives an example of a

young Black girl's rapist who was acquitted based on the jury's argument that the victim was "probably not a virgin" (Crenshaw, 1991: 1279) at the time of the rape, as if losing one's virginity takes away the right to consent to sexual interaction. Wriggins (1983) attributes this to the historic stereotype associating Black women with lack of chastity. Crenshaw (1991) points out the sharp contrast with the conviction of five Black teenagers for raping a White middle class jogger, commonly referred to as the Central Park Jogger (Crenshaw, 1991). Crenshaw's analysis of intersectionality was proven 20 years later after a confession from the actual perpetrator forced the convictions to be subsequently vacated (History.com Editors, 2019). Black women are considered unrapable, while the rape of a White woman by a Black man is regarded as bestiality and a major criminal offence. Crenshaw (1991) problematises the stark differences in the way issues affecting Black women are handled along gender lines, a phenomenon previously researched by Wriggins (1983) with similar observations and conclusions.

Three decades later, Crenshaw continues using intersectionality to highlight the invisibility of Black female victims of rape; they are still systemically treated as unrapable, because they continue to be "unbelievable" (Crenshaw, 2016). While the injustice against Black female victims of rape happens without much attention, rendering them invisible in their own experiences, the harsh treatment of Black men accused of rape receives much attention and support, the same way that White female victims of rape did in 1983 and 1991 (Wriggins, 1983; Crenshaw, 1991). As Wriggins (1983) posits, the law that doubted Black women's chastity may have long changed, but the systemic race and gender discrimination against Black women remains the same. The intersectionality of Black women's lives is still as problematic as it was before the term intersectionality was used with specific reference to it.

2.9 WHEN ALL WOMEN ARE WHITE AND BLACK WOMEN DO NOT EXIST

In her review of the history of discrimination and inequality in the United States, Welke (1995) focuses on the period 1855-1914. She analyses the intersection of race, gender, and class in the lives of Black women, in the public transport system. Welke reviews some of the cases that went to court because of Black women's marginalisation, based on their race, gender and class. Trains during those times had a special coach reserved for women travelling alone, or with children or with partners, and another one reserved for men. However, in the case of Chilton v. St. Louis &

Iron Mountain Ry, Mrs Chilton was prevented from riding in the ladies' first-class coach because she was a Negro, indicative of the exclusion of Black women from the definition of "woman". In its defence, the railway company argued that Mrs Chilton had been offered the smoker coach which she "obstinately, wilfully, and foolishly refused" (Welke, 1995: 262). The company policy which reserved the coach for women was ignored and Mrs Chilton was disqualified by her race. The policy was meant to protect women but excluded women like Mrs Chilton, because "…all women were White" (Welke, 1995: 276).

Mrs Chilton was offered the rough coach with all kinds of men from whom the White women travelling exclusively in the ladies' coach were being protected. Her expression of fear was ignored, as all men could ride comfortably in it, including Black men. In this case, "all Blacks were men" and the Black women's gender was not taken into consideration. All trains had the first class coach which was also the ladies' coach, and yet Black women were not allowed in it because they were considered low class (Welke, 1995). Black women were rendered invisible as all their needs were ignored and they were forced to make do with whatever was available.

Even though she does not use the word intersectionality to describe the Black women's experiences, Welke (1995) attributes these women's lives to the convergence of their subordinate race, gender, and class. Similarly, Brah and Phoenix (2004) depict Black women's lives around the same era by analysing Sojourner Truth's "Ain't I a woman?" speech. Brah and Phoenix (2004) argue that the speech perfectly demonstrates the intersectional life of Black women, as they are marginalised, and their contributions and capabilities are not considered. While the Black women were dismissed as weak against Black men, they were treated as undeserving of the assistance that White women were readily provided based on the weakness associated with their gender and class (Brah & Phoenix, 2004). Truth (1851) argued that she could do everything that any man did if only she was allowed, thus challenging society's failure to acknowledge women's rights and Black people's rights, both of which influenced systems of domination against her. That is a clear demonstration of Black women's lives at the intersection of race, class and gender during the 19th century (Brah & Phoenix, 2004; Welke, 1995). It epitomises Crenshaw's (1991) assertion that Black women's interlocking social identities render the quality of their experiences different from that of White women (Crenshaw, 1991: 1245).

2.10 THE CENTRALITY OF SOCIAL INTERSECTIONALITY IN WOMEN'S LIVES

After three decades intersectionality continues to prove its importance as a centring theory for the marginalised along diverse social identities, including race, gender, class, sexuality and immigration status (Gray, 2018). Crenshaw (1989) originally used intersectionality as an academic analysis of inequality in the legal fraternity, primarily along racial and gender lines. It subsequently gained popularity as a Black feminist theory among scholars across disciplines, in recognition of the similarity of the politics of subordinate social identities such as race, gender, class, sexuality, immigration and any other social identity identified as a source of one's marginalisation (Ferree, 2018; Carbado & Harris, 2019) . To emphasise the centrality of social identity in people's lived experiences, Gray (2018: 147) quotes Forney's *Three years of hate: The very best of In Mala Fide*, which said "Even if they were all Mother Teresas, that still wouldn't change the fact that they're aliens. They have a different culture, and that fact alone means they shouldn't be here", referring to ethnic minority migrants in America. Intersectionality as a Black feminist theory is therefore critical for ethnic minority studies as it provides a platform for epistemological research, enabling the oppressed to shine the light on their lived experiences from their own standpoint. If they are indeed *aliens,* then it follows that the privileged White feminists will deliberately exclude them from their advocacy for equality.

Crenshaw continues to problematise the double standards in the treatment of Black women versus that of Black men who are victims of police brutality, often associated with racial injustice, through the Say Her Name campaign launched in 2014 (Crenshaw, 2020). To illustrate women's systemic marginalisation, Crenshaw (2016) demonstrates how little Black female victims of police brutality are recognised, as opposed to Black male victims. While the names of the Black male victims were recognised by almost hundred percent of her TED Talk audience, the names of the female victims were recognisable to only 4 members of the audience (Crenshaw, 2020). According to Crenshaw (2016), the women's names slip through society's consciousness, as they are ignored and excluded by those who are supposed to champion their cause, such as civil society, media, politicians and policy makers, because they do not fit the frame of the general problem.

2.11 THE CREATION OF AN INTERSECTIONAL BLACK WOMAN

Crenshaw, with the Centre for Intersectionality (2015), showed that, while Black boys were said to be suspended from school at a ratio of 1:3 to White boys, which was substantial, Black girls were found to be suspended at a rate of 1:6 and up to 1:10 in some parts of America. Similarly, Crenshaw at a WOW conference talked about a 2016 project by President Obama called "My Brother's Keeper", which was aimed at addressing prosperity barriers faced by ethnic minority boys and men, leaving out ethnic minority girls and women. The programme ignored the fact that 75% of the problems identified centred on race and class and as such were identical to those experienced by ethnic minority girls and women, and yet they had been deliberately excluded from the project (Crenshaw, 2016).

Similarly, women on the African continent are forced to internalise their "intersectional erasure" at an early age, which Crenshaw refers to as "intersectional failures of yesterday" (Crenshaw, 2016). A good man continues to be defined by his ability to provide for his family, while the woman is the homemaker managing household chores for free (Jaga & Bagraim, 2017; Helman, Kaminer & Malherbe, 2018). Such attitudes reflect society's oblivion to the long-term psychological effects on boys and girls as they grow up believing that boys and men matter more than girls and women at home, school and subsequently, the workplace. Although women's contribution in the workplace is appreciated, it is still considered to be inferior to that of men (Moswete & Lacey, 2015).

2.12 CONTESTATIONS IN INTERSECTIONALITY

Despite intersectionality being hailed as the most significant theoretical contribution from women's studies in feminist studies (McCall, 2005; Jorba & Rodó-de-Zárate, 2012; Bilge, 2013), it has not escaped criticism (Nash, 2008; Lombardo & Verloo, 2009; Menon, 2015; Hira, 2016; Winer, 2021). Different studies problematise it for different reasons.

Although McCall (2005) praises intersectionality, she criticises it in a few areas where she finds it inadequate. She argues that different social identities are more complex than they are assessed and are therefore inadequate to be used as forms of inequality. She argues for the use of an intra-categorical approach to intersectionality where the social identities are further dissected to their

smallest possible nature. She proposes empirical research using a statistical approach to confirm if the social discrimination among groups exists. However, Rodó-de-Zárate and Jorba (2012) contend that McCall (2005) failed to demonstrate the relationship between the inter-categorical approach and the research method she used. They further argue that the study only illustrates the complexity of the social identities and falls short of demonstrating their convergence, due to the statistical method used. This therefore supports the use of qualitative research methods in intersectionality as it provides different individuals the opportunity to communicate their personal experiences with their specific variant of the social identity.

Furthermore, intersectionality as a qualitative research tool uncovers intra-categorical diversity at the convergence of race, class and gender (Ncube, 2018) as well as religion (Atewologun, Bebbington & Showunmi, 2016). This therefore discredits McCall's claim that intersectionality is unable to recognise the complexity of women's social identities resulting from intra-categorical dynamics. In her argument for intersectionality, Crenshaw (1991) points to the importance of intragroup dynamics, which she acknowledges is often ignored by identity politics.

Geerts and Van Der Tuin (2013) argue that intersectionality has failed to adequately analyse power dynamics and how they affect individuals. The paper further criticises its exclusion of experiences of the slightly privileged, making intersectionality theory a "defeatist theory of victimisation" (Geerts & Van Der Tuin, 2013: 175). The criticism fails to acknowledge the fact that those with slight privilege still remain marginalised due to the fact that their social identities remain subordinate, arguably tampering with their sense of belonging as their slight privilege does not necessarily change the quality of their life experiences (Holvino, 2010; Ncube, 2018). Although Geerts and Van der Tuin (2013) critique the vagueness of intersectionality definitions, other studies have praised it for the same reason, arguing that it opens it up to diversity (Davis, 2008).

In a critique of intersectionality, Menon (2015) argues that intersectionality is a name developed in the Western world for a phenomenon that already existed in the developing world as if it was new. The study posits that intersectionality is being imposed on non-Western countries, without recognising the complexity and heterogeneity of social identities such as race, gender, and class. This criticism seems popular among critiques of intersectionality, including those from Western

countries (McCall, 2005; Geerts & Van der Tuin, 2013). Banerjee and Ghosh (2018) concur with Menon (2015) on the prevailing challenges resulting from intersectional politics in India. However, Menon (2015) agrees with Crenshaw (1991) that if implemented correctly, intersectional politics can benefit the marginalised if it recognises all subordinate identities and develops strategies to liberate the affected.

It would be impossible to conduct a single study on people's lived experiences covering all social identities, as some may not be applicable in some instances. After all, one's identity is formed by "interlocking and mutually reinforcing vectors of race, gender, class, and sexuality", with "woman" itself a "contested and fractured terrain" (Nash, 2008: 3). Intersectionality therefore gives scholars the opportunity to study individuals' lived experiences as per their social identities, recognising their heterogeneity. In critiquing some intersectionality critics, Tomlinson (2013: 1013) argues that "dominant modes of thinking and habits of academic life can authorise promoting and echoing partial truths with confidence, even certainty, as if they were the whole". While it is helpful to critic intersectionality, it would be even more helpful if the critics were more truthful (Tomlinson, 2013).

2.13 CONCLUSION

This chapter introduced intersectionality as the key conceptual framework used in this study. It discussed the history of women's subordination based on the convergence of their minority social intersectionality. The chapter then illustrates how intersectionality presents a critical opportunity to emancipate women to improve the quality of their experiences, both socially and professionally. The complexity and diversity of women's lived experiences is centred around their individual social identities, with each woman experiencing her oppression differently (Collins, 1986; Hoskin, Jenson & Blair, 2017; Gouws, 2018). Women in developed countries (Collins, 1998; Loubier & Richardson, 2008; Diehl, Dzubinski & Taylor, 2019; Tissier-Desbordes & Visconti, 2019) experience life in intersectional ways similar to those in the developing world (Booysen & Nkomo, 2010; Dlamini, 2013; Banerjee & Ghosh, 2018). The study concludes by acknowledging the contentions intersectionality has experienced through the years.

The next chapter discusses literature relating to the lived experiences of women in leadership, including STEM leadership, literature on the intersectionality of women in STEM leadership.

CHAPTER 3: LITERATURE REVIEW

3.1 INTRODUCTION

This chapter delves deeper into the literature on the lived experiences of women leaders in the STEM sector. It analyses, among others, women's motivation to follow the STEM career path, challenges they face in the sector, obstacles to women's career progression, tough internal conversations and the difficult career decisions women must make to either remain or leave the sector. The chapter starts with a critical discussion of women in leadership literature, including STEM leadership. It then discusses barriers prohibiting women from accessing leadership positions, followed by a review of intersectionality leadership literature. It concludes by looking at how intersectionality impacts the lived experiences of women in STEM leadership.

3.2 THE JOURNEY OF WOMEN IN LEADERSHIP

> *The paramount destiny and mission of woman are to fulfil the noble and benign offices of wife and mother. This is the law of the creator* (Supreme Court, 1872).

Several decades later, the "law of the creator" has changed drastically, with the number of women in employment growing exponentially in most parts of the world. Table 3.1 below illustrates a trajectory of women's employment in Botswana, South Africa, the rest of Africa and the world, for a minimum of 15 years.

Table 3. 1: % Female labour force participation rate (World Economic Forum, 2019

Country	% Female labour force participation rate (15 years +) 1990	% Female labour force participation rate (15 years +) 2019
World	51%	47%
Africa	62%	61%
Botswana	47%	65%
South Africa	41%	50%

The table above shows progress in the number of women in paid employment, reflecting Botswana's performance better than that of South Africa. The African continent was also reflected to be performing better than the rest of the world.

However, the report from the International Labour Office on women's leadership ascendency showed that women were still unable to break into leadership roles at the same rate as men. According to the report, only 34% of women the world over made it into leadership positions. It is worth noting that while women in five of the countries reported on had equal opportunities to be in leadership positions, none of which were African, in some countries women's leadership opportunities were as low as 10%, some African countries included (World Economic Forum, 2019). Within that reporting year, 60 countries had reduced the gap on this indicator and 50 had relapsed, while the gap in 34 countries remained the same (World Economic Forum, 2019).

Although paid employment was exclusively a man's prerogative for a long time in some parts of the world, women globally have generally made adequate inroads in employment (Kolb & McGinn, 2011). Women in the developed world started enjoying paid work much earlier, but the gendered nature of employment persists globally (Kolb & McGinn, 2011). As opposed to the times when women were legally prohibited from certain employment sectors (Supreme Court, 1872), women are now considered employable in all employment sectors in most parts of the world. They however are still generally unpromotable (Elbers & Grigore, 2018; Hansen, 2020). Figure 3.1 below is an illustration of women's participation in the U.S. workforce.

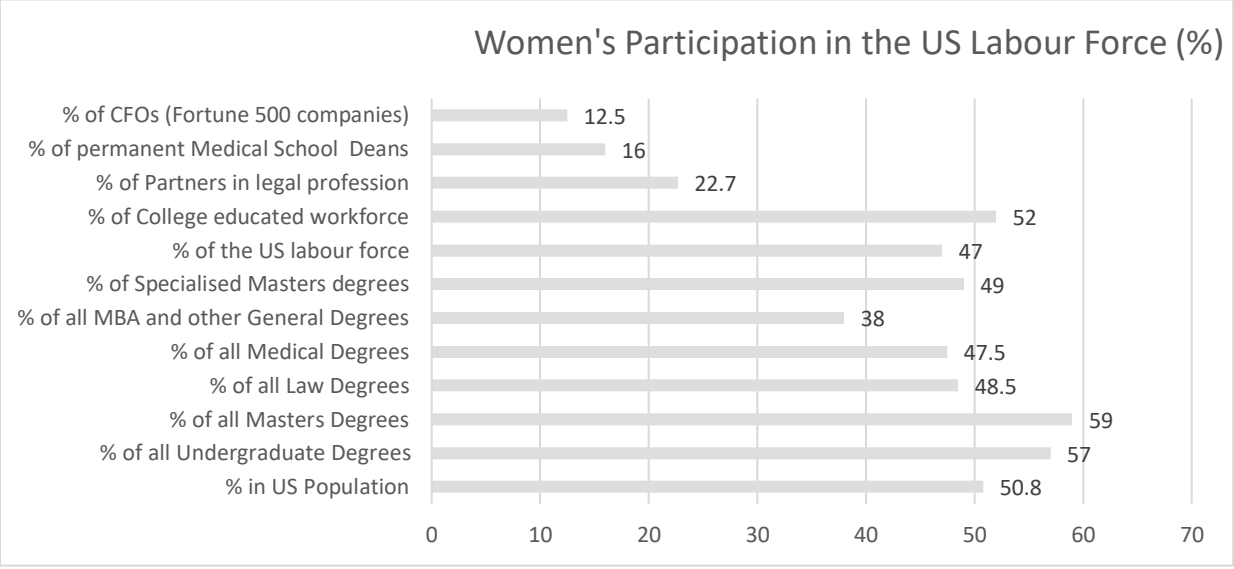

Figure 3. 1: Women's participation in the U.S. workforce (Boesch, Ellmann & Warner, 2018)

The women made a slightly higher percentage of the population. Despite being the most college educated in the workforce, holding the most undergraduate and master's degrees, they hold much fewer leadership positions. While they held 47.5% of the medical degrees, only 16% of them were permanent medical school deans. If women make it into such professions, progression becomes a near impossible battle. Despite the growth in women's participation in the labour force, the number of women in leadership has been growing at a slow pace (Kettler, Mullet & Rinn, 2017; Boesch, Ellmann & Warner, 2018).

Schein (2001) conducted a repeat of her 1970s study on psychological barriers to women's advancement in the US. The 2001 study was extended to include the UK, Germany, China, and Japan. Over 20 years later, the findings from the US male and female perspectives still attributed managerial characteristics to masculinity. This study revealed the unchanging belief in and characterisation of leadership as a male prerogative. While this notion has been dismissed over the years as an unfair misconception (Carli & Eagly, 2003; Karam, Konrad & Sidani, 2015; Amaratunga, Haigh & Shanmugam, 2017), reality supports Schein's findings, as demonstrated by the insignificant number of women in Standard and Poor (S&P) 500 leadership positions (McCain, 2022).

3.3 GENDER DIFFERENCES IN LEADERSHIP STYLE

The differences between the ways women and men lead have been studied and acknowledged through the years, with both strengths and weaknesses highlighted (Amaratunga, Haigh & Shanmugam, 2017; Goethals & Hoyt, 2017). The world has, however, been slow to embrace female leadership styles as adequate in their entirety, as a result of cultural stereotypes, despite research proving their effectiveness (Amaratunga, Haigh & Shanmugam, 2017; O'Connell & McKinnon, 2021). There are leadership traits which are considered to be feminine, such as being empathetic and emotional (Hoyt & Goethals, 2017; Bilimoria, Buse & Van Oosten, 2017). Those are considered weak leadership traits, meaning women who display them are dismissed as too soft and unqualified for leadership positions. Amaratunga, Haigh and Shanmugam (2017) posit that women's leadership styles make them good transformational leaders. However, humanity's insistence on male leadership and dismissal of female leadership style has prompted some women to try to conform to subtle societal expectations by presenting themselves as masculine and

therefore better leaders than the average woman (Amaratunga, Haigh & Shanmugam, 2017; Kettler, Mullet & Rinn, 2017). The same humanity, however, struggles to accept women who display non-conforming gender characteristics, and still views them unfavourably for leadership positions (Davis & Sanchez-Hucles, 2010; Amaratunga, Haigh & Shanmugam, 2017).

This continuing subtle rejection of women's leadership styles results in undue pressure on women in leadership (Ellemers, Rink, Derks & Ryan, 2012; Kettler, Mullet & Rinn, 2017), as well as the continued lack of women in leadership (Goethals & Hoyt, 2017; Tandrayen-Ragoobur & Gokulsing, 2022). Hoyt and Goethals recall how Hillary Clinton was demonised for challenging Donald Trump for presidency during the 2016 campaign, resulting in sexist slogans such as "Trump that bitch" (Hoyt & Goethals, 2017). These slogans on buttons attacking Hillary Clinton were best sellers during the campaign, so much so that even her own supporters ended up buying them (Erichsen, Schrock, Dowd-Arrow and Dignam, 2020). It is therefore evident that although Americans are considered to be progressive, most of them still equate leadership with masculinity. Hillary Clinton being the first female nominated presidential candidate in the history of America was culturally shocking for the country (Erichsen et al., 2020). According to Gillard and Okonjo-Iweala, women in leadership are generally considered unlikeable or "bitchy" (2020: 175). Similarly, STEM careers tend to follow traditional career models that favour men more than women (Amaratunga, Haigh & Shanmugam, 2017; O'Connell & McKinnon, 2021). Based on perceptions that the ideal STEM employee is a man, STEM work and career expectations include long hours, face time and uninterrupted career paths (Hoyt & Goethals, 2017; Pringle et al., 2017).

3.4 THE IMPORTANCE OF DIVERSITY IN LEADERSHIP

Men continue to dominate the higher leadership positions, while women seem very close to reaching gender parity in lower management positions. That shows how the work environment continues to associate leadership with masculinity (Derks, Ellemers, Van Laar & De Groot, 2011; Gorsuch, 2019). Table 3.2 Below compares the involvement of women in FTSE 350 companies' boards between October 2015 and January 2021.

Table 3. 2: Women in FTSE 350 companies (Hampton-Alexander Review Press, 2021)

United Kingdom FTSE 350		
Descriptor	**Oct-15**	**Jan-21**
Number of women on boards in FTSE 350	682	1,026
Representation of women on boards in FTSE 350 (as a %)	21.90%	34.30%
Number of all-male boards in FTSE 350	15	0
Number of companies with 33%+ women on boards in FTSE 350	53	220
Number of boards with only one woman	116	16
Representation of women in leadership roles in FTSE 350 (as a %)	24.5% (in 2017, when data collection began)	29.40%

Worth noting is the impressive leap of women in the UK FTSE 350 boards from 682 to 1026 between 2015 and 2021, with some companies even having more women than men on their boards (Hampton-Alexander Review Press, 2021). The eradication of all male boards, as well as the significant reduction of boards with only one woman coupled with 300% increase in the number of boards with 33% or more women, was yet another milestone worth noting. This, however, did not happen by itself: the UK government embarked on a deliberate campaign to encourage companies to appoint more women to their boards. The initiative started in 2015, and 5 years later a significant upward shift had been realised, as illustrated in Table 3.2 above. However, the increase in the number of women holding leadership positions was significantly low, at less than 5% increase in the same period.

A growing body of research continues to argue for diversity and inclusivity in leadership as diversity of any kind, including gender, gives the organisation the opportunity to be more impactful (ILO, 2016; Janaswamy & Mishra, 2018; Catalyst, 2020). Countries globally continue to make strides at different paces, as illustrated in the cases of the US and the UK boards above. Worldwide, women hold 19% of board seats and 5% of CEO positions, with only 13% of the companies studied having gender-balanced boards (ILO, 2016). Unfortunately, the equality strategies are silent on women's race. It therefore has the potential to systematically disadvantage non-white women as it ignores their standpoint at the intersection of gender and race, while giving the semblance of progress (Canham, 2014; Atewologun, Sealy & Vinnicombe, 2016).

3.5 THE JOURNEY OF WOMEN IN STEM

The STEM sector is guilty of gender inequality and continues to make women feel like outsiders (Carli, Alawa, Lee, Zhao, & Kim, 2016; Diekman, Steinberg, Brown, Belanger Clark, 2017). Just like any other "important" domain in society, STEM started off as an exclusive male privilege and continues to be regarded as such (Adams et al., 2014). Women have finally broken through, but still struggle for acceptance as able and worthy equals (Blackburn, 2017; Miner et al., 2019). STEM professionals continue to emphasise masculinity and as such treat women like outsiders (Blackburn, 2017). Women feel "iced" out, from enrolment in STEM recruitment (Correll & Wynn, 2018; Yang & Carroll, 2018) to employment progression (Wynn & Correll, 2018; Miner et al., 2019).

Advocacy to make STEM more inclusive has gained traction through the years as scholars continue to seek understanding of the situation and propose mitigating strategies (Diekman & Weisgram, 2014; Stamp & Tan-Wilson, 2015). Unfortunately, such efforts have only had an impact on entry into the field, as STEM occupations still struggle with the retention of women (Diekman & Weisgram, 2014; Chu, Ivie & White, 2016). Different countries' initiatives aimed at recruitment and retention of women in STEM have not been as successful at retention (Bilimoria, Lord & Marinelli, 2014; Chu, Ivie & White, 2016; Dasgupta & Dennehy, 2017).

The first female STEM Nobel Laureate was Marie Curie in 1903 for an invention in physics and in 1911 in chemistry, after having struggled to get admission into university because of her gender She set the record of being the only person to win 2 Nobel Prizes, and in 2 different sciences. Out of the more than 600 Nobel Prizes awarded since inception in 1901, by 2020 only 20 recipients had been women. The Nobel Prize is arguably the greatest recognition any scientist can achieve, and it can go a long way in motivating others to aspire for the same, something which the European Union has started taking advantage of (European Commission, n.d.).

Having a woman as the only double laureate should not only be motivating to other female aspiring scientists as well as active scientists, but should also be confirmation that gender has no bearing on women's leadership capabilities (Stout, Dasgupta, Hunsinger & McManus, 2011; Levy, London & Shin, 2016). However, the fact that only 3% of the laureates are women, so many years

later, is likely to have a negative impact as those women seem to be extremely special, and their achievements unattainable. Some leading male scientists, such as Professor Alessandro Strumia, have been vocal in their views on women's place in science. According to Strumia (n.d.), referring to Marie Curie's Nobel Prize, physics was invented by men as a men's only field, and only women who have proven themselves beyond reasonable doubt are admissible. This is confirmation that women in STEM are readily disqualified from recognition as potential leaders, and only women who are exceptional will be accepted. Men, on the other hand, seem to be qualified by their gender and do not need to prove themselves in any way.

3.6 THE DEARTH OF WOMEN IN STEM LEADERSHIP

> *By the time women enter college the gender disparity in STEM majors is stark, especially in the physical sciences and related disciplines (e.g., physics, mathematics, engineering, computer science). This gender disparity signals to women that their group doesn't really belong in these professions* (Stout et al., 2011: 255).

Women's employment has generally reached parity (Seguino, 2016; Miner et al., 2018), with some studies even decrying the negative impact the so-called gender equality drive has had on men's employability in some countries (Seguino, 2016). Some STEM professions are also near parity (Tao & Mcneely, 2019). In some instances, women outperform men academically (Liang, Jones & Robles-Pina, 2018; Bloodhart, Balgopal, Casper, Sample McMeeking & Fischer, 2020). However, their gender continues to be a hindrance in their professional performance (Finez & Sherman, 2012; Bloodhart et al., 2020). Women in STEM are not immune to that hindrance (Bloodhart et al., 2020), with men 2.2 times more likely to work in STEM professions than women (Bloodhart *et al.*, 2020: The Status of Women in the U.S., n.d.).

During their schooling years girls are led to believe that they do not belong in the world of STEM (Tandrayen-Ragoobur & Gokulsing, 2022; CBC Radio, n.d.). If they do well in STEM subjects, they are made to believe that it is only a matter of time before their true incapacities show (Bilimoria, Buse & Lord, 2014; Robnett, 2016). STEM has had a significant increase in the number of female graduates across all levels. However, those numbers continue to decline as the individuals join employment – and beyond (Bilimoria, Lord & Marinelli, 2014; Robnett, 2016; van Veelen, Derks & Endedijk, 2019).

Numerous studies have highlighted the somewhat promising increase in the number of women in STEM occupations (Barnett, Ceci & Williams, 2009; Diekman & Weisgram, 2014; Ash et al., 2016). McCullough (2011) found that only 26% of the total STEM workforce in America were women. By 2021 women in the STEM workforce had increased to 35%, despite acquiring 50% of the STEM bachelor's degrees, and making up 50% of the total workforce (National Center for Science and Engineering Statistics, 2023). These numbers decline as you go up the leadership ladder as very few women make it beyond a certain level of leadership (Bilimoria, Lord & Marinelli, 2014; Robnett, 2016; Johnson, Widnall & Benya, 2018).

India is one of the countries with a strong cultural influence where a girl's education is viewed as less valuable to her family but more valuable to her in-laws. The Government of India has put in place initiatives to expand the number of girls who opt for the STEM field and has seen an increase, from 32.3% in 1989–90 to 47.9% in 2016–17 (Gupta, 2019). India has therefore made significant gains from its initiatives aimed at promoting gender equality in STEM education and employment. Role models have emerged, such as female scientists working in India's space research, breaking the sociocultural stereotypes that make women believe that they cannot have a career and a family (Tag, 2016). The career prospects of STEM graduates are being harnessed in India, as parents now see it as an advantage to their daughters' prospects for good marriages (Huyer, 2015). In Singapore, women in STEM struggle with patriarchal Asian sociocultural and industry norms that stereotype them and their potential for leadership (Dutta, 2018). Arab countries are not very different, as the nature of their culture negatively impacts women's lives in STEM occupations (Hamzah, Ismail & Zulkifli, 2017).

consequently, in the words of Bilge (2020), women are now at the table, but they remain in the menu as men are still in control. Women in STEM are worse off, as inadequate attention has been paid to the disproportionately low number of women in STEM leadership and its impact on the future of women in STEM (Mccullough, 2011; McCullough, 2020). The sociocultural dynamics discussed above pre-determine women's progression fate in STEM occupations as they only make low level to medium leadership positions after a lot of hard work, which often does not earn them any elevation (Dutta, 2018). Dutta (2018) found that 70% of the participants seemed to have

accepted their fate and were not willing to put in any extra effort. Interestingly, the articulations of "not being interested" were dialectically situated alongside articulations of "being interested, but not being able to", pointing to both societal and organisational cultures as barriers to women's leadership in STEM (Dutta, 2018:237). The women are pressured into seeing themselves according to the gender roles, at the intersection of gender and culture, such that they too cannot conceive of themselves as belonging in STEM leadership. The women view themselves as homemakers, disqualifying themselves from the possibility of progressing to leadership positions. On the contrary, men are considered to be the providers, and therefore naturally qualified to be leaders (Dutta, 2018). This national culture is projected into organisational culture, where leadership is generally seen as masculine, concretising women's barriers to STEM career elevation (Seron, Silbey, Cech & Rubineau, 2018).

Although an increased number of women join STEM occupations, conditions of employment present a unique set of challenges for women, influencing their experiences differently from those of their male counterparts (Pringle, et al. 2017; Moseman, 2019). Women's subordinate social identities have been found to play a central role in making their experiences different from those of men and shaping their career paths (Smith et al., 2013; Ceci, Ginther, Kahn, & Williams, 2014; Dasgupta, Scircle & Hunsinger, 2015; Sax et al., 2020). The convergence of social identities in STEM leadership are discussed later in the dissertation.

3.7 THE STEM LEADERSHIP LEAKY PIPELINE – STAY PUT OR SHIP OUT

Fewer women than men join STEM occupations after graduation, while more women leave STEM occupations for other fields of employment than men (Smith et al., 2013; Dasgupta, Scircle & Hunsinger, 2015). Women in STEM are faced with the difficult decision of whether to remain in the STEM profession or find better opportunities for progression elsewhere (Carli et al., 2016; Fouad, Chang, Wan & Singh, 2017; Sparks, 2017; van Veelen, Derks & Endedijk, 2019). That decision is influenced by their sense of belonging guided by their perception of their STEM environment, resulting in a feeling of adequacy or otherwise (Blackburn, 2017; Brown & Ramsey, 2018; Bloodhart et al., 2020). Nowak, Marinelli, Lord & Bonner (2014) conclude that women leave the mining profession in Australia, which is in the STEM sector for unrelated fields, because opportunities for leadership roles are not coming as fast as they think they should. Tremblay et al.

(1998) and Chang et al. (2012) assert that individuals can choose to change careers not only because they are unhappy where they are but also because they have a greater desire for career progression satisfaction and are prepared to get it elsewhere. According to Bilimoria et al. (2014), recognition was one of the reasons singled out for staying. Being recognised for one's hard work gives hope that promotion is on the way, and therefore reason enough for one to hang around.

Women's oppressive lived experiences in STEM (Chang, 2019; Hyman, Wilkins-Yel & Zounlome, 2019) manifest through different forms of barriers influenced by the convergence of their multiple subordinate social identities (Ceci et al., 2014; Blackburn, 2017; Dutta, 2018; Clark, Dyar, Inman, Maung & London, 2021). Gender, race (Armstrong & Jovanovic, 2015; Blackburn, 2017), class, immigration status, age, religion and culture are among those (Corneille et al., 2019; Hyman, Wilkins-Yel & Zounlome, 2019). Those hurdles have resulted in the STEM leaky pipeline, as highly able women end up opting out of STEM occupations (Dasgupta, Scircle & Hunsinger, 2015; Aeschlimann, Herzog & Makarova, 2016; Liu, Brown & Sabat, 2019).

3.8 BARRIERS TO WOMEN'S PARTICIPATION AND PROGRESSION

Although women's employment in most parts of the world is now a norm, they continue to face a plethora of barriers in career progression (Robnett, 2016; Liu, Brown & Sabat, 2019). Women in STEM are hardest hit, as their work environment seems incapable of shedding the image of being masculine (Lauwo, 2018; van Veelen, Derks & Endedijk, 2019). The gendered STEM environment perpetuates women's negative self-conception both in terms of self-esteem and self-affirmation (Lewis et al., 2013; Herrmann et al., 2016; Liu, Brown & Sabat, 2019). Such self-misconceptions continue to be reinforced by men who are self-appointed gatekeepers, bold enough to tell women that they are not welcome in STEM (Clark et al., 2021).

Women in STEM constantly have to jump through hoops to make a recognisable impact and prove they are worthy of leadership positions (Bilimoria & Lord, 2014; Buse & Bilimoria, 2014; Dutta, 2018). When women make it, it is usually up to middle management positions, with very few occupying senior leadership positions (Bilimoria, Lord & Marinelli, 2014; Corneille et al., 2019). Despite the global acknowledgement of poor retention of women in STEM leadership, research on women's STEM leadership is still inadequate (McCullough, 2020). STEM is viewed as critical

to the development of countries and failure to retain women excludes a critical human resource (Dasgupta, Scircle & Hunsinger, 2015; National Center for Science and Engineering Statistics, 2023). This study therefore looks at some of the barriers faced by women in leadership, and also demonstrates how they hinder women in STEM leadership.

Some of the barriers experienced by the women are work-life balance (Devi, 2014; Faiz, 2015; Kalysh, Kulik & Perera, 2016; Brue, 2018, 2019; Clark et al., 2021), gender role stereotype (Adams et al., 2014; Deemer, Smith, Carroll & Carpenter, 2014; Kahn & Ginther, 2017) and the glass obstacle course (Huyer, 2015; Sabharwal, 2015; Amon, 2017; Victor & Shamila, 2018; Thornton, 2019). Other leadership barriers women struggle with include lack of viable role models and mentors (Young, Rudman, Buettner & McLean, 2013; Bilimoria & Lord, 2014), double-bind (Debebe, 2017; Hoyt & Goethals, 2017) and imposter syndrome (McDowell, Grubb III, Geho, 2015; Chu, Ivie & White, 2016; Hofmeyr, Nakazwe-Masiya & Price, 2018). Women are perpetrators of some of the barriers, such as queen bee syndrome and tokenism (Derks, Van Laar & Ellemers, 2016; Diehl, 2017; Sterk, Meeussen & Van Laar, 2018). Although self-handicapping affects both men and women, it is worth noting the effect it has on women's progression opportunities (Lucas & Lovaglia, 2005; Brown, Park & Folger, 2012). Matilda effect is a barrier that has been associated specifically with women in STEM (Rossiter, 1993; Glynn, Huge & Knobloch-Westerwick, 2013).

Sandberg (2015) places responsibility squarely on the shoulders of women to "lean in" or do more to make it to the desired senior leadership positions. However, even after countries around the world have devised strategies and initiatives to increase the number of women in STEM leadership, those efforts continue to fall short (Robnett, 2016; Bloodhart et al., 2020). Research continues to demonstrate that these barriers are greater than women's desires and choices to "lean in" in order to progress in STEM leadership, as they continue to struggle with these barriers (Ceci et al., 2014; Tandrayen-Ragoobur & Gokulsing, 2022). Understanding these barriers that hinder women's progression in STEM is therefore vital, as it will positively influence the development of policies and strategies aimed at changing the status quo (Bilimoria, Lord & Marinelli, 2014; Dasgupta, Scircle & Hunsinger, 2015). Sandberg's assertion for women to "lean in" is both

encouraging and unfair on women considering the insurmountable challenges the women grapple with.

3.8.1 Imposter phenomenon

Imposter syndrome is a concept developed by Clance and Imes in 1978, in recognition of the way women view themselves as less capable and less deserving than their male counterparts (Clance & Imes, 1978; Hernandez, 2014; McDowell et al., 2015; Bothello & Roulet, 2019). According to Clance and Imes, a significant number of high achieving women often attribute their success to such things as luck, charm, fraud, coincidence or hard work, but never to talent or competence (Clance & Imes, 1978). Even though these women are able to maintain their good performance, their feeling of phoniness overwhelms their self-worth, making it impossible for them to recognise themselves as high achievers (Clance, Dingman, Reviere & Stober, 1995). Their self-doubting inner voice tells them that the achievement was not authentic and therefore cannot be repeated (Clance & O'Toole, 1988; McDowell et al., 2015; Hofmeyr, Nakazwe-Masiya & Price, 2018). Consequently their desire and ability to progress are also negatively impacted because they view opportunities for progress as a set-up to expose their inadequacies (Clance & Imes, 1978; Clance & O'Toole, 1988; Clance et al., 1995; Britton, Lindemann & Zundl, 2016; Hofmeyr, Nakazwe-Masiya & Price, 2018).

Although men also experience the imposter phenomenon, research has revealed stark differences between the genders in the effect of feelings of inadequacy. While women experiencing the imposter syndrome dread success, men experiencing the same imposter phenomenon embrace their achievements and use them as confidence boosters (Clance & Imes, 1978; Clance & O'Toole, 1988). When more opportunities present themselves, the women often choose to forego them while the men take advantage of the advancement opportunities (Clance & Imes, 1978; Clance & O'Toole, 1988). This illustrates the connection between culture imposter syndrome and the gender role stereotype which is yet another barrier to women's progression stemming from women's upbringing and family life.

Clance and O'Toole (1988) argue that men are able to overcome their imposter syndrome faster and better than women as they benefit from societal inoculation urging them on, while negatively

persuading women against success. Girls and women are taught to behave in ways that are contrary to society's expectations of a leader (Clance et al., 1995). Clance et al. (1995) assert that women are taught to avoid assertiveness, power, confidence, independence, and directness from a young age, while on the other hand men are raised to possess such qualities, which are also considered good leadership traits. Those who try to embrace those traits are afraid of the repercussions of their "unnatural" actions and choose to deny their achievement and competence (Robnett, 2016; Goethals & Hoyt, 2017). The gender role stereotype barrier is discussed in detail elsewhere in this study.

3.8.1.1 Imposter syndrome in STEM

Individuals with subordinate social identities are more at risk of experiencing the imposter syndrome (Britton, Lindemann & Zundl, 2016). That is because there are not many members of their group who are successful at what they are aspiring to do (Britton, Lindemann & Zundl, 2016; Hyman, Wilkins-Yel & Zounlome, 2019). That creates the feeling of being an outsider, and a nagging fear of failure (McDowell et al., 2015; Britton, Lindemann & Zundl, 2016). Women in STEM are among those women who experience the imposter phenomenon due to the extreme gender imbalance in the field, across all levels (Britton, Lindemann & Zundl, 2016; Pope & Faulette, 2020). Women in STEM live with the same realities highlighted by Clance and O'Toole (1988), as well as Clance et al. (1995), defining women's self-conceptualisation of competence from an early age of their education up to employment (Britton, Lindemann & Zundl, 2016).

Where successful women are a minority in their profession as they are in STEM, they are more likely to suffer from the imposter phenomenon than men in a similar situation (Blackburn, 2017; Clark et al., 2021; Tandrayen-Ragoobur & Gokulsing, 2022). Constant overt discrimination from male counterparts such as Professor Strumia telling a group of female scientists they are lucky to be in STEM only because of affirmative action, is not helping these women's self-esteem (Giuffrida & Busby, 2018). The impact of such words on the self-efficacy and future of younger female physicists at the conference is unimaginable. Such experiences reinforce the imposter feelings experienced by women by confirming what they thought they already knew (Clance & Imes, 1978; Clance & O'Toole, 1988; Clance et al., 1995; Chu, Ivie & White, 2016; McCullough, 2020).

3.8.2 Gender role stereotypes

Girls grow up being taught to be feminine while boys are taught to be masculine. They are each taught gender-appropriate games and are involved in gender-appropriate house chores (Beaman, Duflo, Pande, & Topalova, 2012; Robnett, 2014). They grow up with constant reminders of what their gender is capable of achieving and that influences the rest of their lives, including career choices (Lewis et al., 2013; Carli et al., 2016; van Veelen, Derks & Endedijk, 2019). People opt for challenges within stereotypical expectations, more often than they would opt for what is often regarded as unnatural (Marx & Ko, 2012; Master & Meltzoff, 2020).

3.8.2.1 STEM gender role stereotypes

Girls grow up with the gender role stereotype influencing the way they view themselves and the way others view their suitability for STEM careers (Robnett, 2014; van Veelen, Derks & Endedijk, 2019). Often when women choose STEM careers, they have to work hard to prove beyond reasonable doubt that they too belong as they battle with the gender stereotypes challenging their sense of belonging (Lewis et al., 2013; Clark et al., 2021). In his discredited presentation, Professor Strumia clearly articulated the nuanced expectations that for women to gain recognition and acceptance in STEM, they should prove themselves differently, using Marie Curie – an exceptional scientist who reached greater heights than either men or other women – as an example (Strumia, n.d.). The stereotypic cues influence the individuals' self-efficacy and self-concept negatively, which Deemer et al. (2014) call the stereotype threat. Women in STEM leadership live with the constant challenge and pressure of proving that they are better than their stereotyped race or gender so much that they fear confirming the stereotypes (Deemer et al., 2014). Their choices are therefore not necessarily out of free will, but out of fear of challenging the status quo, or simply out of oblivion (Clark et al., 2021; Kim & Meister, 2022).

Women's self-confidence is eroded by their minority social identity and constant expectation of failure, irrespective of their performance. They attribute their achievements to chance and dismiss them as unsustainable because society defines STEM in male stereotyped terms (Stout et al., 2011; Britton, Lindemann & Zundl, 2016; McCullough, 2020). These feelings of inadequacy have led to some women exiting STEM professions due to their inability to see prospects of success in the STEM sector beyond their current position (Britton, Lindemann & Zundl, 2016).

3.8.3 Role models and mentors

A role model, as originally defined by Merton, is a person who holds a certain position and is exemplary to others (Morgenroth, Ryan & Peters, 2015). Levy, London & Shin (2016) define a role model as someone who displays traits and behaviours of a successful person. McIntyre, Paulson, Taylor, Morin, and Lord (2011) more closely describe a role model as someone who exemplifies success to other members of his or her group. Such group membership can be determined by gender, culture, age, race, or any other form of shared identity. These role models therefore act as motivation to aspiring members of their group as they demonstrate all possibilities of achievement – that their kind of people can make it (Morgenroth, Ryan & Peters, 2015; Swafford & Anderson, 2020).

When girls and boys grow up they look up to older, same gender members of their families and societies (Sharma, 2018; Giménez-Nadal, Mangiavacchi & Piccoli, 2019). These same gender role models shape the lives of children into adulthood. Naturally, girls grow up to be homemakers following their mothers' example, while boys grow up to be heads or leaders of families following their fathers' example (Helman, Kaminer & Malherbe, 2018; Giménez-Nadal, Mangiavacchi & Piccoli, 2019). The same concept applies in occupational leadership, as women grow up having learnt gender role stereotypes and gendered expectations (Dasgupta, Scircle & Hunsinger, 2015; Hofmeyr, Nakazwe-Masiya & Price, 2018; Sharma, 2018). The impact of role modelling was proven by Bandura's 1961 social cognitive theory experiment. In that experiment, children were given Bobo dolls with no instructions on what to do with them; after having observed the researchers behaving abusively to the dolls, the children repeated the abusive treatment of the dolls (Bandura, Ross & Ross, 1963). Just as in Bandura's experiment, children learn behaviour, including gender stereotypes, from the environment they are socialised in from an early age (Morgenroth, Ryan & Peters, 2015). Such learnt behaviour includes delinquent behaviour, aggression and affection, which can be learnt from observing peers, siblings or parents (Ackers & Burgess, 1966, 1973; Brady, 2017). Individuals surrounding young minds become their role models and will have a lasting influence on their life decisions (Brady, 2017). Such influence extends to self-efficacy for under-represented learner populations based on their subordinate social identities such as race or gender (Levy, London & Shin, 2016; Eaton, Saunders, Jacobson & West, 2020). Consequently, they develop self-limiting behaviours which can lead to unintentional self-

sabotage due to the limiting views of their group (Hoyt & Simon, 2010; Dasgupta, Scircle & Hunsinger, 2015). As women transition into adulthood, they continue to witness more men playing leadership roles in the world of work than women, rendering positive role models extremely important in women's leadership journey and aspirations (Burnette, Hoyt & Innella, 2012; Herrmann et al., 2016; Blackburn, 2017).

Women develop self-doubt and dismiss their achievements as accidental and unsustainable (Li, Hughes & Myat Thu, 2014; McDowell et al., 2015; Hofmeyr, Nakazwe-Masiya & Price, 2018) because they have not seen anyone like them making it (Lockwood, 2006). That is because they lack intra-gender role models to motivate them and convince them that they too are capable of doing better than men.

3.8.3.1 The importance of role models and mentors in STEM

> *Someone like me can be successful* (Lockwood, 2006: 36).

Unfortunately, the numbers of those who progress remain lower by comparison (Barnett, Ceci & Williams, 2009; Nowak et al., 2014). Lack of intragroup role models makes it difficult for women in STEM to believe in themselves despite doing well academically (O'Bannon, Garavalia, Renz & McCarther, 2010; Levy, London & Shin, 2016; Miner et al., 2019). This results in girls opting for other fields of learning, where there are role models and where their prospects of progress are clearer and greater (Stout et al., 2011). This is influenced by the social and organisational culture of STEM that continuously reinforces the belief that they do not belong there, irrespective of their efforts (Herrmann et al., 2016; Diekman et al., 2017). As a result, there have been very few women in STEM leadership globally.

Women in STEM leadership are far fewer than men, due to its historical masculine nature (Buettner et al., 2013; Shein, 2018; van Veelen, Derks & Endedijk, 2019); this has resulted in fewer positive role models for women who want to join the STEM employment sector (Buettner et al., 2013; Smith, 2013; NSERC, 2017). Women need to see more women who have made it in STEM leadership to look up to as role models and mentors for them to believe that they too can make it (Stout et al., 2011; Dasgupta, Scircle & Hunsinger, 2015; Hatti & Vidyasagar, 2018). Instead, women who join STEM find most of the leadership roles occupied by men. This does not

imply that individuals cannot benefit from other-gender role models. However, for women in STEM benefitting from other-gender role models is complicated further by the socio-cultural influence that dismisses women as unsuitable for STEM (Dasgupta, Scircle & Hunsinger, 2015; Bloodhart et al., 2020). Professor Strumia's assertion at a conference whose majority attendees were female physicists that a woman got a leadership role ahead of him based on gender discrimination and not capability (Struma, n.d.), destroyed the woman's possibility of being a positive influence on other women.

Although the European Council for Nuclear Research suspended Professor Strumia's membership because of his sexist remarks, it does not necessarily follow that such an action will change the mindsets of the rest of the male STEM leaders who share his views. Women need more female role models who are respected for their leadership positions and the work they do to be positively influenced not only to join the STEM sector but also to aspire to leadership positions.

When encouraged to choose STEM as a career after having learnt throughout one's life that STEM is a man's world (Robnett, 2015), women need much positive role modelling and mentoring to re-work their self-perception (Macphee, Farro & Canetto, 2013; Sloan & Wajngurt, 2019). Men may be good at motivating women to join STEM professions, but it requires seeing more non-prototypical successful women that can reassure women that they too have a chance to make it to senior leadership positions (Herrmann et al., 2016; Hatti & Vidyasagar, 2018). After all, only a successful person with a shared minority identity can be a viable mentor for other women (Marx & Ko, 2012; Atewologun, Sealy & Vinnicombe, 2016).

3.8.4 Work-life balance

Women "take care", men "take charge" (Carter, Prime & Welbourne, 2009).

Societies across the world exist in a gendered manner, with household duties often shared along gender lines. Through the years, women across the world have graduated from being culturally conditioned to doing unappreciated unpaid work around the home (Dill, 1988; OECD Development Centre, 2014; Helman, Kaminer & Malherbe, 2018) or being fired from work for falling pregnant or getting married (Eräranta, 2015), to becoming fully paid working individuals with equal aspirations (Beaman et al., 2012; Muñoz, Pankake, Ramalho, Mills, & Simonsson,

2014, Dennehy & Dasgupta, 2017). However, the cultural burden of being the primary caregiver remains with them (OECD Development Centre, 2014; Thriveni & Rama, 2018; Mbuli & Fletcher, 2021). Women are expected to juggle their work responsibilities and family responsibilities such that none of the two suffer (Faiz, 2015; Kalysh, Kulik & Perera, 2016; Mbuli & Fletcher, 2021). This balancing act is commonly referred to as the work-life balance, a term coined in 1986 by Greenhaus and Eräranta (2015: 63), who called it "the reconciliation of work and family". This reconciliation or balancing act is unfortunately readily held against women even before they start raising families, regardless of whether they intend to raise one or not (Dutta, 2018; Eräranta, 2015).

The meaning of the work-life balance concept to employees is debatable, considering different cultural norms and ways of life (OECD Development Centre, 2014; Beauregard & Lewis, 2018). Fathers nowadays are actively involved in childcare in most parts of the world. Of the 41 developed countries surveyed by the OECD (2016), the United States did not have mandated paid maternity leave, while others offered between 6 weeks and 52 weeks (Beuchert, Humlum & Vejlin, 2016). Some countries offered only maternity leave, but most offered paternity leave as well, in acknowledgement of the father's role in childcare.

Botswana has a mandatory 50% paid maternity leave for 12 weeks and no paternity leave (Botswana Employment Act 6 of 2008). A motion proposing paternity leave was presented in parliament in 2019 and is yet to be concluded. When a radio show discussed the motion to solicit the views of the people, most of the callers opposed the motion as they said it was against the Setswana culture. According to them, a man should stay away from a new-born baby, rendering the paternity leave unnecessary.

3.8.4.1 The work-life balance conundrum

The importance of balancing work and life responsibilities is undeniable for all employees, irrespective of their gender (Beauregard & Lewis, 2018; Fritz & van Knippenberg, 2018). According to French, Dumani, Allen and Shockley (2018), work-life imbalance can result in employee stress, professional burnout, poor attitude to work, high turnover, and absenteeism. Employers therefore have the responsibility to manage the diversity in their organisations by using non-gendered terms and policies that do not associate flexible work with motherhood in order to

be inclusive (Smithson & Stokoe, 2005; Karkoulian, Srour & Sinan, 2016; Beauregard & Lewis, 2018). According to Eräranta (2015), Nordic countries introduced work-life balance as a gender-neutral issue in the 1980s. This makes it easier for all employees who have life challenges to take advantage of the opportunities provided by the strategies, without feeling vulnerable. It is also expected to protect women against the subtle gender stereotype threat where younger women of child-bearing age might be seen as risky to promote as they are vulnerable to work-life imbalances (Pringle et al., 2017).

Considerate and yet subjective behaviour towards women results in work-life balance policies that prejudice women as they are often used to justify and maintain women's subordination (Carlson, Kacmar, Zivnuska & Ferguson, 2015; Beauregard & Lewis, 2018). Policies such as feeding time for nursing mothers and flexible working hours are highly appreciated. However, more often than not they are used to justify that women cannot handle managerial responsibilities because they are consumed by family responsibilities (Jyrkinen & McKie, 2012; Beauregard & Lewis, 2018). In some instances even women give in to such notions as justification for why they are worth less than their male counterparts (Pringle et al., 2017; Beauregard & Lewis, 2018). While it is true that women make use of such policies more than men, it does not mean that they are more dedicated to their family life than their work (Jyrkinen & McKie, 2012; Kalysh, Kulik & Perera, 2016). Men's decision to not take advantage of the policies works to their benefit as they tend to spend more time in the workplace, occasionally going beyond office hours (OECD, 2012). As a result, they look more committed as they glorify the work culture of presentism (Stead, 2013; Kalysh, Kulik & Perera, 2016).

There is yet another debate: Although it would be ideal to view work-life balance as a gender-neutral issue, it is critical to acknowledge the gendered nature of women's lives as principal child and home minders (Eräranta, 2015; Smithson & Stokoe, 2005), lest sight of women as primary homemakers (Burrell & Rollin, 2000). In the final analysis, men benefit professionally from work-life balance policies as they present themselves as ideal workers who are always present because they presumably put work before family.

3.8.4.2 Work-life balance in STEM

Women in STEM leadership struggle equally with work-life pressure as they aspire to progress in their careers while living a fulfilled personal life (Smithson & Stokoe, 2005; Devi, 2014; Stamp & Tan-Wilson, 2015). Most men get adequate assistance from their wives, while women complain that they are not getting adequate assistance from their partners (French et al., 2016). The social support automatically gives men a work-life balance advantage over women (Loefen, 2016; Uzoigwe, Low & Noor, 2016). STEM is generally a male cultured environment where, most of the time, individuals are expected to work long days and be physically present (DeFraine, Williams & Ceci, 2014; Devi, 2014; Uzoigwe, Low & Noor, 2016). If men receive adequate social support from their wives, then it is arguably easier for them to be at work for extended periods of time, fulfilling the physical presence expectation without having to worry about work-life imbalance consequences (Padma & Reddy, 2013; Dutta, 2018). On the contrary, some women in STEM have had their careers thrown off balance after they were forced to slow down (Pringle et al., 2017; Brue, 2019) or take a break to attend to life commitments due to lack of both professional and social support structures (Beil et al., 2010; Brue, 2019).

This clearly illustrates that despite work-life balance policies' illusion of gender neutrality, they are often associated with gendered practices such as motherhood and caregiving (Eräranta, 2015; Smithson & Stokoe, 2005). As a result, women struggle to prove their worth and commitment to their employment to be considered worthy contenders for leadership opportunities (Beauregard & Lewis, 2018; Dutta, 2018). This challenge is even more prevalent in male-dominated occupations such as STEM (Brue, 2019; Pringle et al., 2017). Notwithstanding, work-life balance is a critical contributor to women's unpleasant experiences in leadership (Molineux, Fraser & Carr, 2013; Brue, 2018), including STEM leadership (Devi, 2014; Brue, 2019). Instead of treating it as a source of conflict, work-life balance should be treated as an opportunity to balance these important aspects of employees' lives for complete satisfaction (Devi, 2014; Uzoigwe, Low & Noor, 2016; Pringle et al., 2017), removing the stigma associated with it.

3.8.5 Queen bee syndrome

> *I'm against gender quotas. I can't understand why we need to roll out the red carpet for young women and to make their life easy while I made a lot of sacrifices for my career*

success and I didn't have such a privilege (A senior manager participant in Faniko et al., 2017).

Gender role stereotypes generally force women to work much harder than their male counterparts to get recognition in the workplace, with some fortunate enough to be promoted. While some women do offer to mentor and support other women junior to them, others refuse to serve as beacons of their gender by supporting other women. Such women feel that they earned their position and recognition through hard work and intellect and that others should earn it the same hard way (Faniko, Ellemers, Derks & Lorenzi-Cioldi, 2017). Staines, Tavris and Jayaratne (1974) named such behaviour the queen bee syndrome. Although women who break the glass ceiling are expected to "lift as they climb" (Cech & Blair-Loy, 2010: 393) by creating opportunities for other women to progress, studies reveal that queen bees are even more opposed to gender equality strategies than men (Derks et al., 2012, 2017; Derks, Van Laar & Ellemers, 2016). It is, however, worth noting that they are more supportive of those strategies when they benefit women on their level of the corporate ladder (Derks, Van Laar & Ellemers, 2016; Derks et al., 2017).

Queen bees distance themselves from members of their gender who happen to be a minority in leadership, in the process perpetuating the belief that women do not belong in leadership (Lewis & Simpson, 2012). They see their gender as a liability due to the gender stereotype threat (Derks et al., 2011; Ash et al., 2016; Faniko, Ellemers & Derks, 2021). As soon as the women advance into leadership positions, they assimilate themselves into the culture of the dominant gender and disassociate themselves from other women (Derks, Van Laar & Ellemers, 2016; Derks et al., 2017). They start behaving in more masculine ways to fit in with the male leaders, while adopting traits and leadership styles associated with masculinity (Derks, Van Laar & Ellemers, 2016; Sterk, Meeussen & Van Laar, 2018). However, Faniko et al. (2017) observe that while queen bees generally disassociate themselves from other women, they align themselves with other accomplished women like themselves. As such, these women tend to deny that gender discrimination in the workplace exists, while behaving in a manner that reinforces the gendering of leadership (Derks et al., 2011; Derks, Van Laar & Ellemers, 2016). They instead perpetuate it by attributing their own success to masculinity, in the process discrediting other women for not being like them (Mavin, 2008; Derks et al., 2011, 2012; Ambri, Tahir & Alias, 2018). Some

scholars have even argued that women may use such behaviours as a coping strategy (Derks et al., 2011; Derks, Van Laar & Ellemers, 2016).

While some women dismiss the queen bee syndrome as sexist rhetoric against women (Mavin, 2008; Arvate, Galilea & Todescat, 2018), research on women in leadership exposes how women are their own worst enemies as they do not support one another (Faniko, Ellemers & Derks, 2021). Some queen bees feel that gender equality strategies would trivialise their successes by letting in less deserving women who would have failed to master the masculine personal traits and leadership style (Sabattini & Aizawa, 2013; Leslie, Mayer & Kravitz, 2014; Faniko et al., 2017). Competition between women is said to be more fierce than between men (Sheppard, 2013). Queen bees would rather denigrate women and elevate men instead (Derks et al., 2011; Johnson & Mathur-Helm, 2011).

While queen bees are blamed for their behaviour, the world has a duty to change that mindset by normalising the presence of women in leadership instead of making it an exclusive achievement. Removing the gender bias in leadership will take the weight off the shoulders of women (Derks et al., 2017). To eliminate the barriers to progression created by the queen bee syndrome, women should stop being forced to make extreme sacrifices to get ahead at work, just like their male counterparts. That would reduce the bitterness and hostility that women experience and develop in the workplace, as those who make it think it is their duty to perpetuate oppressive behaviour towards other women by becoming their worst nightmare professionally (Diehl & Dzubinski, 2016; Hyman, Wilkins-Yel & Zounlome, 2019). Leadership culture must shift towards judging both men and women on merit, while according both genders a sense of belonging (Derks et al., 2017).

The difference in age or generation has been found to play a crucial role in terms of attitude to the gender stereotype threat and the queen bee syndrome (Derks et al., 2012; Sterk, Meeussen & Van Laar, 2018). Older generation leaders tend to associate lack of commitment with gender, while the younger generation believes both genders are equally able and equally committed. This is a clear reflection that queen bee syndrome is not a universal female leadership problem, but more of a cultural and generational challenge (Derks et al., 2012).

3.8.6 Tokenism

> *What gains? All you have gotten is tokenism – one or two negroes in a job, or at a lunch counter, so the rest of you will be quiet* (Malcolm X, 1963).

A token is that lone employee who represents a minority group in a workplace, through ethnicity or any other subordinate social division he/she belongs to (King, Hebl, George & Matusik, 2010), such as race (Andrews, 1997) or gender (Zimmer, 1988; Jing, Wu & Yang, 2017). The act of appointing a few representatives of that special group, such as women, making up less than 15% of the organisation's population is called tokenism (Kanter, 1977). The objective of tokenism is to make the gender inequality situation look better than it actually is. Although the tokens are viewed as representatives of their main social groups, they cannot make enough of a contribution to be impactful (Kanter, 1977; Kovalainen & Poutanen, 2013).

Tokenism can result in assimilation, visibility, and contrast (Kanter, 1977). In assimilation, the token is swallowed by the dominant group and ignored in the process, due to their non-prototypical attributes (Stichman, Hassell & Archbold, 2010). Due to his/her nature of being different from the dominant group, the token then stands out, or gains heightened visibility, which in the process highlights the contrast between the token and the dominant group culture (Kanter, 1977). In the process, the tokens are unable to exert themselves and demonstrate their capability and as such lose out on opportunities for progression (Kanter, 1977). Kanter (1977) therefore argues that having an insignificant number of women will not make a difference, as they will be overshadowed by the dominant group and its gender stereotype will prevail. They can be pressured into adopting the culture of the dominant group, in the process failing to make the impact they were brought in for and remaining only symbols of inclusion. Dawson et al. (2016) found that for women to overcome the tokenism on boards, they must make up at least 30% of the board.

Kanter's tokenism theory has not been without criticism. The major criticism centred on its insistence that the more you have women, the less the negative experiences, ignoring other contributing factors (Yoder, 1994). Women experience their tokenism at the intersection of their gender with other subordinate identities such as race, age and culture (Zimmer, 1988). A subsequent study by Stroshine and Brandl (2011) concluded that race contributed more to tokenism than gender. Kovalainen and Poutanen (2013) argue that organisations by their nature

are gendered. They therefore assert that the gender inequality is part of the organisational culture which cannot be stopped by the equal number of the different genders in the organisation. As a result, Kovalainen and Poutanen (2013) resolved to use tokenism with intersectionality as it intersects with other elements such as the dominant culture, which in the case of their study was the engineering culture.

3.8.7 The glass obstacle course/phenomenon

The glass obstacle course refers to subtle formal and informal barriers to career progression faced by women in their endeavour to be successful in their careers (De Welde & Laursen, 2011). De Welde and Laursen (2011) refer to the invisible barriers as the "glass obstacle course", due to their ever changing and persistent nature in women's career experiences, exclusively. The glass obstacle course includes the glass ceiling (Bilimoria & Lord, 2014; Downes, Hemmasi & Eshghi, 2014), glass elevator (Macarie & Moldovan, 2012; Dahmen & Thaler, 2014) and glass cliff (Cook & Glass, 2013; Sabharwal, 2015; Dzubinski, Diehl & Taylor, 2019).

3.8.7.1 The glass ceiling

The glass ceiling has its roots in the American Civil Rights movement of the 1960s, referring to challenges faced by racially disadvantaged individuals in the workplace (Downes, Eshghi & Hemmasi, 2014). It was subsequently adopted by feminist movements to describe the plight of women in leadership (Downes, Eshghi & Hemmasi, 2014). It refers to barriers that are as invisible as glass and prevent women and minorities from ascending the leadership ladder (Downes, Hemmasi & Eshghi, 2014; Yahya, 2017; Yahya, 2018; Dzubinski, Diehl & Taylor, 2019). Some women might be promoted, but would generally be prevented from progressing beyond middle management level (Kathryn, 2018). Policies advocating gender equity in promotions may exist, but the human implementers always find ways of circumventing those policies to the detriment of women (De Welde & Laursen, 2011; Kathryn, 2018).

3.8.7.1.1 The glass ceiling in STEM

The number of women graduating with STEM degrees – or better – continues to be on a positive trajectory (Buse & Bilimoria, 2014; Ceci et al., 2014). Countries such as Australia and the United States, as well as European countries, have invested extensively in the recruitment of more women

into the STEM sector (Bilimoria, Lord & Marinelli, 2014). However, the number of women who are successful or progress into STEM senior leadership positions remains low (Bilimoria, Lord & Marinelli, 2014; Amon, 2017). The glass ceiling has been associated with women's failure to progress in STEM, as women are considered to be outsiders (Bilimoria, Lord & Marinelli, 2014; Wolfert et al., 2019). That results in the cultivation of an environment that suits men and is unwelcoming to women, creating informal glass ceiling aspects in women's leadership opportunities (Hamzah, Ismail & Zulkifli, 2017; Wolfert et al., 2019).

3.8.7.2 Glass cliff

The glass cliff is yet another invisible barrier to women's success in leadership (Haslam, Postmes & Ryan, 2007; Goethals & Hoyt, 2017; Selzer & Robles, 2019). Women are arguably appointed to risky leadership positions where prospects of failure seem more probable than success (Ryan & Haslam, 2005). While women's leadership capabilities are often perceived to be lower than those of men, research has proven how women are often used as scapegoats by appointing them to positions of leadership when the company's demise is (Ryan & Haslam, 2005; Haslam, Postmes & Ryan, 2007; Ryan, Haslam, Hersby, Bongiorno, 2011). When the company collapses, the female leader is berated for the entire situation, ignoring initial motivation for the appointment (Ryan & Haslam, 2005; Linehan & Mulcahy, 2014).

Haslam and Ryan (2005) repeated a study done by Judge (2003), adding more contributing variables. While Judge (2003) criticised women for failing the boards they were appointed to, Haslam and Ryan (2005), considering more variables, argue that women are often set up to fail by being appointed to precarious leadership positions. According to Bongiorno et al. (2011), one of the reasons for such appointments could be that women are generally able to deal with failure more logically than men. Bongiorno et al. (2011) attribute such actions to the "Think Manager, Think Male" phenomenon defined by Schein (1975) together with the "Think Crisis, Think Female" phenomenon defined by Haslam and Ryan (2007). While men are commonly favoured for leadership opportunities, women are better trusted where crisis management is required. The glass cliff therefore is a setup for failure disguised as leadership opportunity (Ryan & Haslam, 2005).

Although it is not clear if women recognise the glass cliff as a setup (Ryan & Haslam, 2005), it is worth acknowledging that women are more likely to take the risk knowingly, considering the scarcity of opportunities for them (Linehan & Mulcahy, 2014). Unfortunately, their choice to take the risk could destroy their aspirations, staying power and reputation – as leader they would be associated with the organisation's failure, even beyond their tenure (Derks et al., 2012).

3.8.7.3 Glass escalator

Williams (1992) coined the phrase glass escalator as another invisible barrier to women's progression, following the glass ceiling. While women hit the glass ceiling preventing them from progressing into senior leadership positions, men take the glass escalator and progress beyond the women's leadership glass ceiling (Hultin, 2003). This paints a different picture of experiences for the two genders. Williams (1992) proved the gender-based discrimination in gender stereotyped employment sectors, showing how men's experiences are different from those of women. Several studies show that women are discriminated against in male-dominated employment sectors (Macarie & Moldovan, 2012; Pande & Ford, 2012; Gorsuch, 2019). The justification for women' glass ceiling in STEM is the fact that women are a minority and are therefore viewed as outsiders. The glass escalator shows that it is possible for minorities to be recognised based on their abilities. However, the glass escalator represents a contradiction, as men are preferred over women when it comes to promotion in female-dominated jobs (Williams, 1992; Macarie & Moldovan, 2012). Men are considered to be natural leaders, with or without the required proficiency, and as such are often pushed up the hierarchy based on their gender, even when they do not feel ready (Williams, 1992) or do not meet the full requirements that their female counterparts are subjected to (Hultin, 2003). Women, on the other hand, would have to work exceptionally hard to be considered, with no guarantee of promotion, in both male- and female-dominated employment sectors (Hultin, 2003), a clear indication that women and men are held to different standards. Employers and customers would rather have women in more supervisory roles, away from being hands-on, because leadership is masculine (Williams, 1992; Hultin, 2003). They are "channelled into more 'masculine' specialties within these professions, which ironically means being 'tracked' into better paying and more prestigious specialties" (Williams, 1992: 257). In the long run, the few men in those occupations end up holding powerful and decision-making positions, consequently perpetuating women's barriers to progression (Hultin, 2003; Macarie & Moldovan, 2012). While

men's minority status is an advantage in female-dominated sectors, women's minority status in male-dominated sectors is a disadvantage (Hultin, 2003). Women still suffer as men get preferential treatment in STEM supporting functions, such as human resource management, accounting or even canteen management in STEM-based organisations, making the STEM environment completely unwelcoming to women.

3.8.8 The double bind

Bateson, Hailey and Jackson (1956) introduced the phrase "double bind" to define situations where individuals find themselves in a dilemma because they receive conflicting messages from those they share significant relationships with and end up losing, no matter which message they respond to (Bateson et al., 1956). It is a situation that is commonly referred to as a catch-22, or a rock and a hard place. You are "damned if you do, and damned if you don't" (Crosby, 2016). Although Bateson et al. (1956) used it to analyse schizophrenic behaviour, they hypothetically explained it in a way that covered all victims, irrespective of their psychological challenges. Further studies clarified it by extending it to not only psychosocial problems but also social problems (Bateson et al., 1962). Sluzki (1967) questions the claims made by Bateson et al. (1956, 1962) concerning the frequency of receiving conflicting messages. He does, however, concur that if the behaviour is observed several times, then it can cause a double bind. He argues that the response of the double bind victim is as important as the message causing it (Sluzki, 1967).

In leadership the double bind occurs at the convergence of women's gender and the culturally oppressive gendered definition of leadership. Where race is an issue, ethnic minority women become the most disadvantaged (Ko et al., 2013). Ethnic minority men place themselves ahead of the women, using cultural oppressions such as the general belief that house chores are for women (Ko et al., 2013; Dutta, 2018). The double bind concept therefore outlines the historical power that men have over women, as well as ethnic majorities over ethnic minorities (Carlson & Dermer, 2016). Although ethnicity is not a subject of this study it represents culture, as different world ethnicities have different cultures, all of which are oppressive towards women.

3.8.8.1 The STEM double bind

The double bind occurs at the intersection of the subordinate social identities of women, making them vulnerable (Crosby, 2016). Issues regarding the disenfranchisement of women in STEM have been discussed for decades. In 1976, minority women decided to share the lived experiences that caused their double bind (Brown, Hall & Malcom, 1976). Ong, Wright, Espinosa & Orfield (2011) define the double bind in STEM as exclusive encounters of minority women as they simultaneously traverse sexism and racism throughout their STEM careers.

Different races and ethnicities have different cultures which dictate their behaviour and attitudes, without necessarily depicting their capabilities or lack thereof (Dutta, 2018; Ong et al., 2011). Gender biases against women dictating which roles are suitable for them also dictate the levels they should ascend to. Women with different identities experience the double bind differently (Ong et al., 2011; Ko et al., 2013; Crosby, 2016). While a white respondent was frowned upon for disagreeing with her male counterparts, Asian and Indian respondents complained of being culturally frowned upon if they tried to be assertive (Dutta, 2018). In both instances, the women were faced with the double bind because it did not matter which way they behaved. If they conformed to expectations, they were dismissed as not being good enough to be leaders, while challenging the cultural norms earned them the criticism that such behaviour was unacceptable and that they were therefore still unpromotable (Dutta, 2018). In the final analysis, these women were "damned if they do and damned if they don't".

3.8.9 The Matilda effect

> *For whomsoever hath, to him shall be given, and he shall have more abundance; but whomsoever hath not, from him shall be taken away even that he hath* (The Gospel according to Matthew, 13:12).

Merton in 1968 first referred to the Matilda effect as the Matthew effect after a verse in the Holy Bible (Rossiter, 1993; Glynn, Huge & Knobloch-Westerwick, 2013). The phenomenon defines an era when women were footnoted and robbed of their scientific contributions. Instead, their male counterparts were fully credited for women's achievements (Rossiter, 1993). Rossiter (1993) decided to name the phenomenon the Matilda effect after the American suffragist called Matilda

Gage who advocated women's recognition in STEM. Glynn, Huge and Knobloch-Westerwick (2013) argue that women's erasure and under-recognition in both STEM and leadership are due to the gender role congruity which fails to reconcile their success with their gender.

Sometimes women experience the Matilda effect as their work in science is credited to male scientists or is undervalued based on their gender and psychosocial expectations (Kretschmer, Pudovkin & Stegmann, 2011; Glynn, Huge & Knobloch-Westerwick, 2013). Marie Curie herself was dismissed as merely her husband's assistant by some scientists who struggled to fathom that women belonged in STEM, even as she won her second Nobel Prize in 1911, five years after her husband's death (The Nobel Prize, 2020; Dominus, 2019).

3.8.10 Self-handicapping

Self-handicapping is a defensive strategy used by individuals who choose not to apply any effort in executing a task to justify failure (Brook & Crocker, 2010; Brown, Park & Folger, 2012; Torok and Szabo, 2018). The individuals are not prepared to deal with a negative outcome and instead choose to find excuses not to apply themselves and use that as a justification for failure, as a way of protecting their self-esteem (Hirt, McCrea & Boris, 2003; Ferradás, Freire & Piñeiro, 2018). Should they turn out to be successful despite their negative expectations, they will then quickly attribute that success to their intelligence and abilities (Bergas & Jones, 1978; Grove & Prapavessis, 2015). According to Arkin and Kolditz (1982), individuals use self-handicapping to maintain a good impression of themselves in public rather than in private where there is nobody watching. Individuals choose to risk failure by not applying themselves for fear of failure, whether it is for fear of judgement by the self or others, in public or in private (Debus, Marsh, Herbert & Martin, 2003; Hirt, McCrea & Boris, 2003).

Self-handicapping is influenced by group stereotypes including gender and race Torok and Zsolt, 2018(Swim & Sanna, 1996; Hirt, McCrea & Boris, 2003). When men decide not to apply themselves, they are given the benefit of the doubt. When they fail, that lack of effort will be used as justification rather than their lack of ability, because men are generally believed to be inherently able (Hirt, McCrea & Boris, 2003). On the contrary, women who decide not to try, the same way men do, are judged differently and more harshly. Their poor performance is attributed to their

gender-based inability to perform. Such conclusions deny women the opportunity to benefit from behavioural self-handicapping, while encouraging men to take advantage of it (Hirt, McCrea & Boris, 2003).

According to Brown, Park and Folger (2012), women consequently choose effort valuation rather than self-handicapping. They prefer to try, because they know that for them the consequences of self-handicapping outweigh the benefits. Women do, however, self-handicap for reasons such as lack of motivation or disregard for performance (Brown, Park & Folger, 2012). Women resign themselves to self-handicapping after failing and accept that they would not succeed even if they tried.

3.8.10.1 Self-handicapping in STEM

Although studies focusing on self-handicapping by women in STEM could not be found, it was evident in some qualitative studies on their lived experiences. Some research participants explained that they were not interested in getting promoted because they knew that the STEM gender stereotype would work against their efforts (Dutta, 2018). According to Hirt, McCrea and Boris (2003), women suffering from imposter syndrome are more likely to self-handicap, as they are driven by their low self-esteem, in order to prove themselves right. Interestingly, women's self-handicapping is classified as lack of ability, while men's failure is often attributed to self-handicapping (Hirt, McCrea & Boris, 2003; Brown, Park & Folger, 2012). By implication, fewer women will progress to leadership positions and consequently the low numbers of women in STEM leadership will prevail.

3.9 INTERSECTIONALITY STUDIES

The use of intersectionality in leadership studies is a relatively recent development in the United States of America (Davis & Sanchez-Hucles, 2010; Holvino & Ruiz Castro, 2016; Loubier & Richardson, 2008), Europe (Zander, Zander, Gaffney & Olsson, 2010; Atewologun et al., 2016; Dy, Marlow & Martin, 2017) and Africa (Booysen & Nkomo, 2010; Dlamini, 2013; Moorosi, 2014; Ncube, 2018). Madsen et al. (2017) underscore the importance of using intersectionality in women's leadership studies to understand women's experiences in pursuit of satisfactory career progression.

Studies on intersectional leadership analyse the lived experiences of women across different employment sectors and positions of responsibility. Different studies analyse different subordinate social identities, depending on prevalence in the country where the study is conducted. Intersectionality in America more often involves gender, race, ethnicity and social class, with culture and religion emerging due to the multiplicity of race and ethnicity (Holvino, 2010; Neal, 2014; Romero & Valdez, 2016; Tao, 2018). In Europe gender and social class are more prevalent subordinate social identities being studied (Bilge, 2014; Fritz & van Knippenberg, 2018); Bilge problematises it as "Whitening Intersectionality". Intersectional leadership studies in South Africa and Zimbabwe cannot ignore race as both countries have been more racially diverse, with South Africa still a young democracy following apartheid rule, though racism was less prevalent in Zimbabwe than in South Africa (Booysen & Nkomo, 2010; Dlamini, 2013; Mahadevan, Mayer & Surtee, 2018). Africa is generally a patriarchal continent, which makes gender central to intersectionality studies in Africa (Dlamini, 2013; Moorosi, 2014; Dosekun, 2022).

As culture dictates that African women must respect their husbands, even in the workplace, men expect their female colleagues to respect them and find it difficult to respect authority from their female supervisors (Booysen & Nkomo, 2010), more so if the leaders are younger women (Ncube, 2018). While gender discrimination is the only discrimination white female employees contend with when pursuing leadership opportunities, black women further contend with racial discrimination (Dlamini, 2013; Atewologun et al., 2016). Sanchez-Hucles and Davis (2010: 176) refer to intersectionality of race and gender as the "multiple axes of oppression that challenge the Whiteness of women, the maleness of all people of colour, and the heterosexuality of all". In some instances, women with those subordinate social identities face further discrimination as they are seen not to be black or white enough, either because they are coloured or they are educated (Holvino, 2010). The assumption is that they do not share the struggles of their people because they are somehow privileged, while they do not qualify for the perks of the racially superior group, making them "the outsider within" (Holvino, 2010).

The convergence of self-efficacy and subordinate social identities is not always negative, as the disadvantages can be used to advantage. Moorosi (2014) demonstrates how the intersectionality

of gender, race and class influenced the outcome of a leadership programme for school leaders in South Africa. The convergence of race, gender and class in the African women's background was a motivating factor, as they were the most disadvantaged at the beginning of the programme (Moorosi, 2014). That might also be because those with more subordinate social identities are always pressured to perform better, hence the reason why women always work harder than men. However, their gender often overshadows their performance in relation to progression opportunities (Smith, 2013).

Botswana, as an African country, is not immune to any of the consequences of interlocking social identities for the lived experiences of women, both socially and professionally. Consequently, women who display assertiveness or dominance are often teased and labelled masculine. This stereotype gives men a competitive advantage, as women have to work harder to prove their capability while carrying themselves in a perceived acceptable way, which is not necessarily straightforward (Davis & Sanchez-Hucles, 2010; Canham, 2014).

This study analysed the intersectionality of three subordinate social identities that women in Botswana STEM leadership are contending with: gender, culture, and age. It is, however, worth noting that the inclusion of culture as a subordinate social identity is arguably representative of race/ethnicity as ethnic minority culture, including Black culture is more oppressive of women than that of White people (Truth, 1851; Crenshaw, 1991; Ncube, 2018). As Aptheker (1981) asserts, it is amiss for feminism to separate culture from race in the liberation of women.

3.9.1 Intersectionality in leadership studies

When introducing intersectionality, Crenshaw (1989) used different legal cases to illustrate ways in which black women experienced organisational life in totally different and more complex ways than black men and white women. In Degraffenreid v General Motors the black women alleged that General Motors had discriminated against them based on their gender and their race. When General Motors decided to use a seniority system to lay off employees during a recession, the axe automatically fell on black women, as General Motors had only started recruiting them in 1970, after all other groups.

The court ruled that it would be unjust to allow the women to argue their case based on gender and race, as it would give the black women an undue advantage if they were to be considered as black and female. As far as the court was concerned, General Motors had been hiring black people – and women since 1964 – which meant that both their gender and race had been benefitting them (Crenshaw, 1989). The court, however, failed to appreciate the complexity of the black women's disadvantages brought about by the intersectional discrimination, as only blacks who were men and women who were white had benefitted, and no blacks who were women, or women who were not white (Crenshaw, 1989).

In Moore v Hughes Helicopter, Moore alleged that she was discriminated against on the basis of gender and race and passed over for promotion (Crenshaw, 1989). The court decided to confine Moore's claim to gender discrimination as a black woman. Crenshaw (1989) argues that the court's insistence on Moore pursuing her case as a black woman is premised on the notion that a white woman's experience of gender discrimination is the standard measure of gender discrimination. However, the white woman's class advantage cushions her against such experiences and can therefore not be included in Moore's lawsuit. Once again, the court failed to recognise the differences between black women and black men, as well as between white women and black women. As Crenshaw (1991: 1242) puts it, "the problem with identity politics is not that it fails to transcend difference, as some critics charge, but rather the opposite-that it frequently conflates or ignores intragroup differences". Moore's intragroup differences as a woman and as a black person manifested at the same time, influencing the way she experienced the workplace in a different manner from her colleagues who were either white or male, and never both (Crenshaw, 1989).

Women around the world continue to face diverse organisational challenges resulting from structural and political systems. Over 30 years later, intersectionality continues to be used to analyse people's experiences in leadership across the globe. Studies have identified different subordinate social identities, which have proven to be the source of different individuals' oppression and unflattering experiences, negatively shaping their career progression (Moorosi, 2014; Holvino & Ruiz Castro, 2016; Harris, 2017; Hollis, 2018). Women's subordinate social identities continue to define them and their capabilities in the workplace, as leadership continues

to be defined in ways that exclude women (Breslin, Pandey & Riccucci, 2017; Harris, 2017; Holvino, 2010; Tao, 2018).

Beliefs and misconceptions that men are better leaders than women (Amaratunga, Haigh & Shanmugam, 2017), as well as the stereotypic perceptions pitting white women against black women leaders (Holvino, 2010; Rosette, Koval, Ma & Livingston, 2016), control the leadership narrative. Such beliefs and misconceptions urgently call for a reflexive stance, requiring from those involved in studying intersectionality in leadership to problematise their own social location at the intersection about which they seek to produce knowledge (Holvino, 2010; Howton, Selzer & Wallace, 2017).

3.10 INTRA-GROUP DYNAMICS

> *…Discrimination is based both on perceived and real inter-group differences (differences among people from different identity groups), in addition to intra-group differences (differences among people in the same identity group). Central to identity performance theory is the idea that to appreciate a person's vulnerability to an intra-group distinction, one must take into account how a person "works" or is perceived "to work" their identity* (Carbado & Gulati, 2013).

Intersectionality exposes the inadequacies of the prevailing measures which conveniently see race and gender as homogeneous and ignore the intragroup differences and disadvantages (Crenshaw, 1989, 1991; Canham, 2014). Carbado and Gulati assert that discrimination not only results from inter-group differences but also from intra-group dynamics involving members of the same group. While ethnic minority women share gender with white women, they also have the additional burden of being black, while female. As a result, black women's concerns are excluded from solutions which focus on the experiences of the white woman as the prototypical woman or the black man as the prototypical black person (Crenshaw, 1989). For example, the racialised discrimination against individuals based on their performative dynamics including name, accent, marital status and political identity affects women in the workplace differently (Johnson, Brown, Carlone, & Cuevas, 2011; Carbado & Gulati, 2013; Carbado et al., 2013).

While that seems like an uphill battle, some of the ethnic minority women may have their battles made steeper by their struggles with intragroup dynamics resulting from uncommon social identities such as sexuality, immigration status, language (Hollis, 2018), ethnicity, religion (Atewologun, Sealy & Vinnicombe, 2016 Blommaert, Coenders & van Tubergen, 2014; Karam, Konrad & Sidani, 2015), culture (Atewologun, Sealy & Vinnicombe, 2016), social class and age (Ncube, 2018). In the final analysis, these individuals are impacted negatively by their intragroup peculiarities that may be an advantage to other members of the group (Canham, 2014), making them the "outsiders within" (Canham, 2014). The lived experiences of Shirley Chisolm epitomise this phenomenon. She suffered both sexism and racism from her male and white colleagues in the United States Congress, and yet, was not fully embraced by the Black Freedom and the women's movement as she did not share their social class struggles (Curwood, 2014).

According to Collins (1986), there can be an advantage to being an outsider within as one has the opportunity to observe and appreciate situations from both ends of the spectrum. Purdie-Vaughns and Eibach (2008) concur that individuals with more subordinate social identities can benefit from their invisibility as they are not prototypical and as a result are not seen to be in the competition for recognition or elevation. According to this theory, the minority may benefit from being ignored as the focus is on the men who are regarded as prototypical, while those that have more inferior social identities are referred to as non-prototypical (Purdie-Vaughns & Eibach, 2008). However, I am of the view that intersectional invisibility cannot have advantages, as invisibility is discrimination that one cannot control or hide, such as gender, race, and disability. This can affect self-efficacy and performance, and progression in the long run.

In a racialised society, ethnic minority women find themselves at the bottom of the order of significance, and that follows them to the workplace (Canham, 2014; Atewologun, Sealy & Vinnicombe, 2016). While ethnic minority women are disadvantaged by gender and race, some of the women are further disadvantaged by class (Ncube, 2018). Black middle class women are cushioned by their social standing, while those from poorer backgrounds struggle to break the class barrier to progress (Ncube, 2018). It is, however, worth noting that such intragroup dynamics only result in smoke screen situations where those that perceive themselves to be better than other members of their group lose sight of the magnitude of the burden of their common subordinate

social identity. As a result, they end up resting on the laurels of their tokenism without realising that it is actually costing them the bigger picture in the long run (Lewis & Simpson, 2012). In the final analysis, those from the marginalised group compete among each other for recognition and elevation, which sometimes results in conflict among themselves, sometimes to the point of even bullying each other for recognition in the workplace (Hollis, 2018).

An auto-ethnographic study by Howton, Selzer and Wallace (2017) illustrates the power of intra-group dynamics as well as the importance of engaging women's multiple social identities in leadership studies. The study's initial aim was to explore the women's leadership identity as defined primarily by their sense of purpose and gender to help improve women's leadership prospects. In the event where only women were involved, white women became the dominant group. That required attentiveness to experiences of the ethnic minority women, recognising the intersectional nature of their social identities to ensure an inclusive solution to women's leadership challenges (Howton, Selzer & Wallace, 2017). A White research participant shared her observations of black participants and facilitators being subtly prevented from sharing their racialised experiences as if they were a digression. This is similar to an observation by Bilge (2013) at an intersectionality conference in Germany where ethnic minority women's contributions on race were frowned upon.

According to Hollis (2018), some of the women experienced vicarious bullying because of their multiple subordinate social identities. That is when bullies use other people around them, such as subordinates, to fulfil their mission while pretending to be empathetic towards the victim (Hollis, 2018). Women who find themselves in such a situation have unfulfilled careers as they struggle to even dare to dream of career progression. Some of the consequences of the convergence of women's subordinate social identities can be as severe as demotion, hostile environments and conspiracies, some of which can be perpetrated by ethnic minority women like the victims, as well as vicarious bullying perpetrated by White LGBTQ individuals (Hollis, 2018). The addition of intragroup subordinate identities such as religion (non-Western religion) to race and gender further complicates the women's workplace experiences and leadership prospects (Howton, Selzer & Wallace, 2017). This supports Crenshaw's earlier insistence on the need to examine how individual social identities measure up on the structures governing the individual's existence in

the organisation and how they reinforce each other negatively. This also illustrates the significance of intragroup intersectionality.

3.11 INTERSECTIONALITY IN AMERICA

Intersectionality continues to be used across different fields of study to analyse different aspects of women's experiences based on their subordinate social identities (Cho, Crenshaw & Mccall, 2015). Some of the fields of learning include sociology (Collins, 2015; Moss & Maddrell, 2017), law (Crenshaw, 2002, 2016; Carbado & Harris, 2019), leadership (Loubier & Richardson, 2008; Davis & Sanchez-Hucles, 2010; Morales, 2019), public policy (Breslin, Pandey & Riccucci, 2017), political science (Gray, 2018; Hancock, 2007; Hughes, 2011), education (Mitchell & Sawyer, 2014; Agosto & Roland, 2018) and STEM (Charleston et al., 2014; Mack et al., 2014; Tao, 2018; Corneille et al., 2019). All these studies analyse the convergence of people's different social identities, such as race, ethnicity, gender, culture, class, nation, religion, disability, and sexuality, and how women are forced to navigate them in different aspects of their lives. As Crenshaw (2016) asserts, the significance of intersectionality is not in the number of social identities, but how they impact one's experiences in their human interactions.

Women's work is often either not appreciated or it is appreciated and acknowledged without the desirable reward of progression (Holvino & Ruiz Castro, 2016). Leadership studies in America therefore employ intersectionality to explore women's organisational experiences (Purdie-Vaughns & Eibach, 2008; Holvino, 2010; Breslin, Pandey & Riccucci, 2017). Intersectionality recognises the limitations of non-intersectional leadership studies and their failure to address the effects of multiple interlocking identities of women (Loubier & Richardson, 2008), as well as intragroup diversity (Agosto & Roland, 2018). Intersectionality theory initially identified race, gender and class as social identities resulting in women's marginalisation in the workplace (Crenshaw, 1989). Subsequent studies identified further oppressive social identities, such as ethnicity, nationality, sexuality (Holvino, 2010), age, religion and language (Hollis, 2018), that minority women in America contend with. Every woman's workplace experience is influenced by her similarities and her differences to her colleagues, and both must be acknowledged and researched for the betterment of the unpleasant and unjustifiable situations most women find themselves in (Holvino & Ruiz Castro, 2016; Breslin, Pandey & Riccucci, 2017).

Most of the intersectional STEM leadership studies located were based on black American women's navigation of their experiences (Loubier & Richardson, 2008; Crosby, 2016). The studies cover women's early intersectional experiences during school to their leadership journeys (Mitchell & Sawyer, 2014; Holvino & Ruiz Castro, 2016).

3.12 INTERSECTIONALITY IN EUROPE

Though not as widely studied as in America, intersectionality is highly acclaimed in European feminist studies; it is applied in different fields of study such as sociology, social policy (European Network Against Racism, 2018), education (Marx & Ko, 2012), women's studies (Yuval-Davis, 2006; Gunnarsson, 2017), law (La Barbera, 2017; La Barbera & Cruells López, 2019), humanities, political science (Lombardo & Verloo, 2009), organisational studies (Blommaert, Coenders & van Tubergen, 2014), leadership and STEM (Fatourou, Papageorgiou & Petousi, 2019), among others. It has been used either as a theory, heuristic device or conceptual framework and it is lauded for its significant contribution to feminist studies (Lewis, 2013; Roig, 2018). It has also been used in shaping public policy in the European Union (EU) (Lombardo & Verloo, 2009; European Network Against Racism, 2018). Different EU member states are, however, expected to develop their own individual policies for implementation and monitoring, hence their unequal progress.

Germany's first female topmost political leader, Chancellor Angela Merkel, had 4 consecutive terms from 2005 onwards, after which she voluntarily retired. This was good for girls and women in Germany, as she symbolised their hopes of becoming leaders. Unfortunately, this may only be true for white girls and women, due to the erasure of race from intersectional studies in Germany (Lewis, 2013; *Goethe-Institut*, 2014). Racial discrimination has been given special prominence over other social identities by the EU (Lombardo & Verloo, 2009) and German legislature provides for the protection of racially disadvantaged individuals. Contrary to this, intersectionality studies in some parts of Europe, including Germany, deliberately avoid addressing race, instead replacing it with ethnicity (Lewis, 2013; Roig, 2018). This despite the fact that intersectionality started off as a black feminist scholarly tool to demonstrate the uniqueness of the experiences of black women at the convergence of their subordinate social identities (Bilge, 2014).

The use of ethnicity does not carry the same weight as race (Lewis, 2013; Bilge, 2014) and results in the invisibility of those who are racially discriminated against by taking away their voices (Lewis, 2013). The subtle repudiation of race and its replacement with ethnicity are presumably associated with different socio-political historical factors affecting EU member states (Lewis, 2013). In Germany, racism is associated with the holocaust, making it a thorny issue where people are forced to pretend racial discrimination is not as bad as it actually is, while reality on the ground is contradictory (Lewis 2013). Studies have demonstrated the domination of White feminism in EU member states such as Germany through White feminists who refuse to acknowledge racial discrimination, to the extent of denying White privilege (Lewis, 2013; Roig, 2018). In the final analysis, racialised women in Germany do not benefit from intersectionality discourses in Germany as their voices are systematically drowned and their peculiar experiences ignored (Lewis, 2013).

Other EU member states such as the Netherlands and Scandinavian countries struggle with the adoption of intersectionality due to reasons different from those of Germany. Owing to these countries' self-promotion as classless and equal societies, they tend to reject race in intersectionality studies (Lewis, 2013). The people are expected to ignore their racial differences and adopt colour blindness based on the EU policy on multiculturalism. However, the policy has been dismissed as a dismal failure by German Chancellor Angela Merkel, as well as President Nicholas Sarkozy of France (Kaya, 2011; Younge, 2011). Such policies and pretences they invoke do not make the problem go away, as demonstrated by Geert Wilders, a political leader who publicly stated that Christian culture was better than Muslim culture and that Christians should be proud of it (Kaya, 2011).

Such a divisive statement coming from a political leader carries much weight and will have an impact on the way Muslims experience life in the Netherlands, in a similar way that Sarazzin in Germany did. That necessitates giving race the prominence it deserves in intersectionality, instead of substituting it with ethnicity or culture which are arguably less thought provoking (Lewis, 2013) and have the potential to gloss over challenges resulting from the convergence of ethnic minority women's subordinate social identities. Moreover, it is critical to engage the ethnic minority women to appreciate how the convergence of their subordinate social identities impact the way they

experience workplaces differently, in order to influence policy development to benefit such women.

Intersectionality studies in Britain are only second to those of America in terms of inclusion of racialised women and the impact it has on their lives (Yuval-Davis, 2006; Lewis, 2013; Bilge, 2014), including leadership (Atewologun, Bebbington & Showunmi, 2016). Unlike in Germany, Black feminists in Britain have a voice and are able to do intersectional studies on women's leadership experiences that not only analyse gender and ethnicity among other social identities, but also race, religion and culture. A significant departure of Britain's intersectionality studies from those in Germany is the collaboration of White and Black scholars in confronting the convergence of race and gender, similar to the situation in America where some White scholars are prepared to confront their race privilege alongside their Black colleagues (Howton, Selzer & Wallace, 2017). That affords everyone the opportunity to deal with confront their subordination or privilege (Atewologun, Sealy & Vinnicombe, 2016).

3.13 INTERSECTIONALITY IN AFRICA

Africa, one of the most patriarchal continents in the world, does not have many studies on intersectionality. Women in Africa continue to struggle with intersectional oppression mostly hinged on ethnic culture commonly oppressive towards women (Uzoigwe, Low & Noor, 2016; Decker & Baderoon, 2018). The patriarchal nature of African societies impacts women's experiences both socially and professionally, ultimately influencing the choices they make about the direction their lives should take (Akanji & Nwagbara, 2012). Such choices are also influenced by societal expectations of individuals based on their gender (Moswete & Lacey, 2015; Dirksmeier, 2017; Dosekun, 2022). Intersectional social identities causing discrimination on the African continent are different from those found in America and Europe, which are predominantly race, gender, and class, as previously demonstrated. Race is still seen as a source of subordination in South Africa due to its history of apartheid rule. In most African countries ethnicity, marital status, social status, profession, nationality, social power and marital status are prevalent sources of discrimination in women's lives (Petitt, 2016; Meer & Müller, 2017; Nencel, Vearey & Walker, 2017; Dosekun, 2022).

Most of the studies on intersectionality on the continent are found in South Africa, across different fields such as education (Moorosi, 2014), leadership (Dlamini, 2013; Carrim & Nkomo, 2016; Mahadevan, Mayer & Surtee, 2018; Ncube, 2018), sociology (including LGBTQIA+) (Nencel, Vearey & Walker, 2017; Rothmann, 2018), gender politics (Gouws, 2018) and social sciences (Helman, Kaminer & Malherbe, 2018). Some studies in Nigeria address the convergence of culture and gender (Dosekun, 2022; Okpokwasili, 2023) and some in Botswana (Petitt, 2016; Becker & Lund Schlamovitz, 2020).

Rothmann (2018) focuses on the need for institutions of higher learning to recognise the need for LGBTQIA+ members of the school community to belong through the development of inclusive policies. The study recognises the intersectional nature of their lived experiences, particularly influenced by the denial from the African culture that homosexuality pre-dates westernisation of the continent (Rothman, 2018). Similarly, Gouws (2018) uses intersectionality to highlight the impact of social identities on power dynamics, illustrating how intersectionality can be employed to encourage intergroup alliances. She relates how a race-based demonstration morphed into a gender and sexuality #EndRapeCulture movement, and also how the Slutwalk in the fight against the oppression of women brought women of different races and classes together. The study is, however, alive to potential challenges due to the diversity of the group members' social identities influenced by historical social and political dynamics. Migrant sex workers experience life differently in Johannesburg, adding immigration status to challenges converging in the social lives of women (Nencel, Vearey & Walker, 2017).

While the above studies focus on social aspects of intersectionality, there are a number of studies in South Africa addressing the experiences of women in leadership. Booysen and Nkomo (2010) use intersectionality as a tool to analyse the effects of Schein's gender role management stereotype at the intersection of race and gender in South Africa. Schein's role management stereotype attributes managerial skills to men and dismisses women as inadequate (Booysen & Nkomo, 2010). Schein (2007) argues that women are often overlooked based on gender and that their individual prowess is ignored in appointments to leadership positions. Booysen and Nkomo (2010) extend it to race as a highly significant subordinate social identity in South Africa's employment history.

South Africa's racial history placed White women below White men, but above Black men, due to their privileged race. As a result, female gendered jobs were exclusively for White women, while domestic work was exclusively for Black women (Booysen & Nkomo, 2010; Helman, Kaminer & Malherbe, 2018), with Indian women working in their homes or family businesses (Carrim & Nkomo, 2016). Although African, coloured and Indian women are all classified as Black post-apartheid, they each have peculiar identities that historically subordinate them in a way that is different from each other. Carrim and Nkomo (2016) argue that cultural influences in Indian women's experiences play a major role in shaping their leadership identity. While Indian women in the workplace are subordinated by their gender like all other women, including White women, they are further subordinated by their patriarchal ethnic culture, as well as the socio-historical positioning of Indians (Carrim & Nkomo, 2016).

The quantitative replication of Schein's 1973 study using Schein's descriptive index intended to measure the extent of the "Think Manager, Think Male" belief, at the intersection of race and gender in South Africa also highlights the centrality of culture to Black women in South Africa. Contrary to original expectations that both White and Black men would associate managerial attributes with men, that finding was mostly among Black men and not White men. That reflects the strong patriarchal culture central to Black communities (Booysen & Nkomo, 2010; Ncube, 2018), including the Indian community (Carrim & Nkomo, 2016). Black women had the highest correlation between characteristics of women and those of good managers of all the four categories (Booysen & Nkomo, 2010). That reflects the strong position women hold in the society and the household, as Black women were often left to take care of the household and hold the extended family together while the husbands went away to work. Most of the time the husbands came back only once a year, making household leadership women's default responsibility (Helman, Kaminer & Malherbe, 2018). On the other hand, Indian women and girls were sheltered and culturally taught to be passive and obedient while the boys and men were encouraged to show up and be assertive (Carrim & Nkomo, 2016).

Race, gender and class continue to influence the work roles and career progression of women CEOs in South Africa (Dlamini, 2013; Mahadevan, Mayer & Surtee, 2018; Ncube, 2018). Even

though all the women share the disadvantage of gender, White women benefit from the privilege of their race, while other women are disadvantaged by both their gender and race, with some influenced negatively by social class (Dlamini, 2013; Carrim & Nkomo, 2016; Ncube, 2018). Additional social identities impacting the women's experiences are culture, language and generation, with disability emerging as a racialised subordinate identity during data collection (Dlamini, 2013). Black and Coloured women's social position is both historic and cultural, as they were considered inferior to White women and culturally inferior to all men (Dlamini, 2013). The convergence of historical and cultural social positions continues to define Black and Coloured women, influencing their workplace experiences and opportunities (Ncube, 2018).

Equally significant here is the illustration of the value of qualitative research methodology in intersectionality studies, as it affords individuals the opportunity to represent themselves and their unique experiences. While it is easy to assume that Black, Coloured and Indian women's experiences are the same, these studies have given the women the opportunity to highlight their differences through the diversity of their subordinate identities (Carrim & Nkomo, 2016). Ncube (2018) identified race, gender and class as subordinate social identities that negatively influenced South African and Zimbabwean women's career experiences and progression. However, some of the participants revealed how young age was a negatively defining identity for women, as well as how Indian women were negatively affected by culture in ways that differed from other ethnic minority women; for instance, some of the high achieving female Indian doctors were forced to stop working as soon as they got married (Dlamini, 2013). Just like the women in Carrim and Nkomo' (2016) study, these women did not resist the cultural expectation.

Language also emerged as a defining social identity intersecting in women's workplace experiences in Dlamini (2013) as well as Mahadevan, Mayer and Surtee (2018). Although Mahadevan et al. (2018) were primarily interested in challenges brought about by diversity of South African women in leadership at the intersection of race, gender, ethnicity, and class, it was revealed how language shaped organisational culture for or against women. After the fall of apartheid, Blacks, Coloureds, and Indians were all classified as Black by the country's Employment Equity Act in an attempt to redress past injustices against them. These three groups are however diverse, with further social identities advantaging or disadvantaging them. This is

similar to the diverse cultures and religions of ethnic minority women in the United Kingdom (Atewologun, Bebbington & Showunmi, 2016), whose experiences of the same workplace were defined by their diverse cultures and religions. While the Asian culture teaches women to be obedient, the African culture teaches women to be assertive, a leadership identity which Asian women struggle with (Carrim & Nkomo, 2016). Conflict is therefore experienced at different intersections, with some female respondents feeling intimidated by the leadership styles of some male counterparts and others feeling disadvantaged by their inability to speak a certain language (Mahadevan, Mayer & Surtee, 2018). Some of the conflicts are linked to historic power imbalances at the convergence of race and gender, which some respondents feel they are still experiencing, years after the beginning of the transformation exercise (Dlamini, 2013; Carrim & Nkomo, 2016; Ncube, 2018). Interestingly, White participants did not experience conflict based on race and gender, which reflects their continued benefit from their privileges of the past (Mahadevan, Mayer & Surtee, 2018).

Most of the cited studies used intersectionality to highlight women's negative experiences in the workplace based on their subordinate social identities. Moorosi (2014), however, discovered the exact opposite as the women's varying subordinate identities impacted them positively. African women, having been at the bottom rung of the social ladder during apartheid, always used that as a motivating factor for them to take full advantage of the opportunity to better themselves (Moorosi, 2014). Evidently, one's social location is determined not only by one's current social identity when accessing leadership positions but also by the "socio-historical political and cultural contexts within which individuals and groups are embedded" (Carrim & Nkomo 2016: 23). The same way that the African women were taught to fight adversity and not let it define them (Dlamini, 2013; Moorosi, 2014), Indian women were taught to embrace it and not fight back (Dlamini, 2013; Carrim & Nkomo, 2016), and that is what defines the leadership identities of these groups of women. Even though Black women were often educated beyond their job requirements, they were overlooked for progression (Dlamini, 2013). The experiences of different South African women in leadership, therefore, are still largely influenced by the intersection of their individual social identities and their social location, as determined by the legacies of structural imbalances of power from the apartheid system (Mahadevan, Mayer & Surtee, 2018).

Ncube (2018) used intersectionality to study the effects of gender, race, and class on the career progression of women in corporate South Africa and Zimbabwe. The study was similar to that of Dlamini (2013), including women in leadership positions below CEOs. It is a comparative study of experiences of women in leadership in South Africa and Zimbabwe, as countries with a similar history of extended White minority rule (Ncube, 2018). Zimbabwe gained independence from Great Britain in 1980, while South Africa transitioned from apartheid rule to majority rule in 1994. Race relations are therefore active in both countries, while gender and class are universal phenomena.

Unlike in South Africa, race is no longer a major phenomenon in Zimbabwe due to the fact that many White people left the country during different major events such as the country's independence and during the eviction of White farmers in the 1990s (Ncube, 2018). However, White privilege still exists in Zimbabwe (Ncube, 2018). White people are still privileged in both countries yet benefit from Black people's unconscious bias towards them (Dlamini, 2013; Ncube, 2018). White privilege still provides access to good schools which subsequently gives White women access to careers of their choice, while systematically disadvantaging Black women (Ncube, 2018). Some White participants complained about being racially discriminated against by their Black colleagues, but it was never to the extent of affecting their work experience and career progression as in the case of their Black colleagues (Ncube, 2018).

Social class was not experienced negatively by White female participants in South Africa due to their race privilege which gave White women automatic recognition by their White superiors based on their race, irrespective of their social class (Ncube, 2018). On the contrary, Black women came from different social classes, which influenced their work experiences and career progression differently (Ncube, 2018). Fair skin has also proven to be advantageous, as those that looked White or had White features were given preferential treatment (Dlamini, 2013). In Zimbabwe, one of the Black women was rejected by a White employer because she was presumably from a less privileged social class, based on her responses to the questions she was asked during a job interview (Ncube, 2018).

Gender proved to be every woman's problem in both Zimbabwe and South Africa, across all races and social classes (Ncube, 2018). Women were not seen as equally able employees, even as they climbed up the leadership ladder, to the extent of being dismissed as beneficiaries of government gender equality reforms in Zimbabwe (Ncube, 2018). Interestingly, the women experienced gender discrimination from other women, some even preferring to promote men over other women. The women cited different kinds of gender discrimination, including lower salaries, being passed over for promotion, being second-guessed by male subordinates, experiencing hostility directed at female biological responsibilities such as pregnancy, gendering female actions and duties, as well as being dismissed as incapable (Ncube, 2018). There was a strong element of patriarchy in both countries, influenced by their respective patriarchal cultures.

The intersection of gender, age and culture was experienced by some of the participants in both countries who supervised older men, some of whom were old enough to be their fathers. Ncube (2018) discusses age identity as an intergenerational dynamic and is not very explicit on the element of culture, which has a huge bearing on the gender and age discrimination. Ncube (2018) found that being supervised by a woman who was younger was something that some of the elderly male employees evidently struggled with. Social culture is quite evident in organisational culture and impacts the way women experience their leadership positions. The women have to work extra hard to earn the respect of their subordinates, who naturally expect them to fail because they are women and they are young (Ncube, 2018) and, in some cases, not White (Dlamini, 2013; Carrim & Nkomo, 2016), to the point of sabotage (Dlamini, 2013; Ncube, 2018). Poverty, which also had racial connotations as underprivileged White women benefitted from White privilege, surfaced as a social identity dictating Black women's opportunities (Dlamini, 2013; Carrim & Nkomo, 2016).

Although most of the articles on intersectionality are based on countries outside Africa they resonate very well with Africa, as many Black people of African descent experience discrimination based on their social identities, on and outside the continent. South Africa moved from apartheid in 1994 but racism is still a big part of the country, while gender inequality is a continent-wide problem (Jefferis & Theron, 2018). The issue of immigration is a hotly debated issue within the continent, as well as in the rest of the world, with the stories of female African immigrants being the most painful (Nencel, Vearey & Walker, 2017).

African women have to endure multiple axes of discrimination influenced by the ancient continental culture that dictates that women are inferior to men (Mordi, Simpson, Singh & Okafor, 2010). Although the continent is mostly modernised, structural, and systemic attributes take time to change, just like everywhere else in the world. The African man's way is always correct, and if women try to complain, they risk criticism (Bhalla & Inna, 2019).

Consequently, women in the workplace may all be female, but their differing subordinate identities further differentiate their experiences and have peculiar significant effects on how they perceive themselves and are perceived by others (Booysen & Nkomo, 2010; Carrim & Nkomo, 2016). These effects are shaped by the social location of one's gender or race, which can be either privileged or oppressed, depending on access to power provided by one's social identity (Booysen & Nkomo, 2010; Carrim & Nkomo, 2016).

3.14 BOTSWANA'S INTERSECTIONALITY DROUGHT

Botswana, as an African country, is not immune to any of the consequences of intersecting social identities for the lived experiences of women, both socially and professionally. Although ethnic differences in the country make women's lived experiences even more diverse, the patriarchal nature of the country's overall culture subordinates women (Kalabamu, 2005; Moswete & Lacey, 2015). No studies using intersectionality in leadership or STEM in Botswana could be found. A couple of studies that looked at the way women's intersectionality affected their social lives in an oppressive patriarchal culture were located. Hovorka (2015) used intersectionality, standpoint, and performativity to study interspecies relations based on the author's exploration of animals in Botswana. The study illustrates the connection between gender, ethnic culture and power signified by the connectedness of certain domestic animals and the gender they are culturally associated with. Cattle, which are a sign of power and wealth in Botswana, have to be branded with a brand that traditionally belongs to men (Hovorka, 2015). On the other hand, women commonly rear chickens, which are culturally seen as pets with no significant financial value (Hovorka, 2015).

A similar study by Petitt (2016) explores how some women in Botswana are supposedly breaking with tradition by engaging in commercial cattle farming. It uses the intersectionality of race,

ethnicity, gender, and class in commercial cattle farming. According to the study, for a woman to own cattle in Botswana she would have to be either a widow, White or Herero. White and Herero women had the largest herds of cattle among all the groups in the study, confirming the negative convergence of gender, ethnicity and race in other ethnic women's lives (Petitt, 2016). While race seemed to place White women at an advantage, it was only to the extent of actively supporting their husbands who played the leadership role. In the final analysis, their gender still allotted them the supporting role, while the men kept ownership status across both races and ethnicities (Petitt, 2016). The women played a supporting role strictly associated with the female gender, such as household chores, as dictated by their cultures (Petitt, 2016). In the same manner, the Herero women did not have a say in the spending of proceeds from the sale of cows they physically looked after as the husbands stepped in with unilateral decisions (Petitt, 2016). Ultimately, all these women were oppressed by their cultures which dictated the extent of their engagement and benefit from the cows based on their gender. Beker and Schlamovitz (2020) used intersectionality as a heuristic to analyse how self-identified gender, age, marital status, nationality, and ethnicity converged in the lives of residents of Gaborone as they were affected by water shortages.

What is common to Hovorka (2015), Petitt (2016) and Beker Schlamovitz (2020) is that they are all non-Batswana who were based outside Botswana when they carried out these studies on intersectionality in Botswana. Published studies conducted by researchers based in Botswana could not be located. There is, however, a trans feminist named Tshepo Ricki Kgositau who is based in Cape Town but writes as a columnist in a local newspaper using intersectionality to bring attention to the disenfranchisement of members of the LGBTQIA+ community in Botswana (Kgositau, 2019). Although her focus is not particularly on experiences in leadership, she highlights leaders' negative lived realities which consequently affect their quality of life both socially and professionally. Although her case against the Government of Botswana seeking recognition of her gender self-affirmation is not on leadership, it reveals the stronghold patriarchy has on women in leadership in Botswana. Alongside her case was a similar case from a male identifying trans-person presided over by a male judge, while hers was presided over by a female judge. Kgositau calls out the female judge's fear of taking responsibility for setting precedence on her landmark case, to the point of missing court without informing the plaintiff's team at some point (Kgositau, 2019). The interplay of culture and gender is likely to have influenced the female

judge's leadership effectiveness, while negatively affecting the female plaintiff's experience with the legal system. None of the studies on intersectionality in Africa identified were based on STEM occupations.

3.15 INTERSECTIONALITY AND WOMEN IN STEM LEADERSHIP

Women in STEM fields are under-represented and are also less likely than men to be in leadership positions generally. Little is known about the intersection of these areas in women in leadership in STEM (McCullough, 2020). This study used intersectionality to explore the experiences of women in STEM leadership.

Women generally have an uphill battle in leadership, as leadership is commonly associated with masculinity (Ryan & Haslam, 2007; Amaratunga, Haigh & Shanmugam, 2017; Diehl, 2017). Women in STEM have an even steeper hill to climb to advance into leadership positions due to the historic masculine nature of STEM (Robnett, 2015; Mccullough, 2020). A number of studies have been conducted on the challenges experienced by women in STEM leadership (Bilimoria & Lord, 2014; Dutta, 2018; Brue, 2019), but very few used intersectionality, such as Adams et al. (2014) and Corneille et al. (2019). The significance of intersectionality in women's experiences in STEM leadership has, however, been acknowledged by some of the studies through recommendations for future studies (Kettler, Mullet & Rinn, 2017; Miner et al., 2018; Dutta, 2018). Most of the studies looked at the subordinate social identities impacting women's experiences in STEM such as gender, culture, race and ethnicity (Beekman & Ober, 2015; Dutta, 2018), as well as age (Miner et al., 2019), without exploring their intersectional impact. Some of the studies on intersectionality in STEM explore challenges faced by women at the early stages of their decision to pursue a career in STEM (Charleston et al., 2014; Harackiewicz, et al., 2016), as well as gender bias (Robnett, 2014, 2016; Moss-Racusin et al., 2018). Even though some of these studies may not cover women's experiences beyond STEM qualification, they equally support the argument that the social determinants of axes of power and systems of inequity remain the same throughout women's involvement with STEM (Smith, 2013; Eaton et al., 2020).

3.16 THE SIMULTANEITY OF RACE/ETHNICITY AND GENDER IN STEM LEADERSHIP

In 1976, a group of ethnic minority women in STEM held a conference on "the price of being a minority woman in STEM" (Brown, Hall & Malcom, 1976). Almost four decades later, the number of White women in STEM is increasing while that of ethnic minority women remains low (Armstrong & Jovanovic, 2015). Several studies have been conducted on the lived experiences of women in STEM leadership (Bilimoria, Lord & Marinelli, 2014; Jean, Payne & Thompson, 2014; Brue, 2019). A host of reasons for the continued dearth of women in STEM have been researched, such as work-life balance (Jean, Payne & Thompson, 2014; Brue, 2018), lack of female role models (O'Bannon et al., 2010; Swafford & Anderson, 2020), as well as self-efficacy (Singh, Fouad, Fitzpatrick, & Chang, 2014). All these studies exclude the experiences of ethnic minority women, and as such, resultant remedies and initiatives geared to improving the problem cannot address the effects of race on the experiences of ethnic minority women.

A considerable amount of literature has been published recently on the simultaneous impact of race and gender on women of colour in the quest for advancement in STEM leadership, with some employing intersectionality (Armstrong & Jovanovic, 2015; Corneille et al., 2019; Hyman, Wilkins-Yel & Zounlome, 2019). Although some studies do not refer to intersectionality, they similarly address the intersectional nature of the experiences of ethnic minority women in STEM, based on their ethnic minority status and gender (Brown, Liu & Sabat, 2019). Race and gender produce power and privilege that birth subtle mechanisms of inequality that produce micro-advantages to male faculty (most dramatically US born, White male faculty) and "micro-disadvantages" to women (most dramatically to WOC) (Corneille et al., 2019: 338), as well as "micro aggressions and intersectional invisibility" (Hyman, Wilkins-Yel & Zounlome, 2019) towards ethnic minority women.

Corneille et al. (2019) identify styles of practising intersectionality as group-centred, process-centred, and system-centred. Group-centred intersectionality focuses on the inclusion of the multiply marginalised groups in the content of the research, such as the ethnic minority women in STEM. Process-centred intersectionality addresses strategies that address the relational nature of power, while system-centred intersectionality entails transforming the systems that perpetuate

intersectional marginalisation (Choo & Ferree, 2010; Corneille et al., 2019). Studies aimed at increasing the number of women in STEM leadership by improving the experiences of ethnic minority women in STEM such that they want to remain in STEM, should apply both group-centred intersectionality and system-centred intersectionality. The application of group-centred intersectionality will promote understanding of the experiences of ethnic minority women who are multiply marginalised compared to White women. Subsequently, system-centred intersectionality will help with the development of systemic changes to address the complex multifaceted systems of oppression impacting the experiences of ethnic minority women in STEM (Corneille et al., 2019).

The importance of an intersectional approach to studying the varied experiences of ethnic minority women's variations in gender stereotypes and women's participation in STEM is underscored by Adams et al. (2014). The study argues for the use of an intersectional approach, as it would assist in the identification of factors influencing the differences among different ethnic groups. According to Adams et al., (2014), culture plays a major role in influencing gender stereotypes and women's participation. Therefore, if one group of women from the same ethnic culture displays less impact from gender role stereotypes, then it would be critical to understand the factors that make them different from the women from a different ethnic culture seemingly affected. Understanding these factors can influence the development of mitigation strategies to change the status quo (Adams et al., 2014). Although the study looked at the intersection of gender role stereotype and ethnicity in STEM participation, its findings can arguably contribute to the improvement of women's experiences in STEM leadership.

Gender, race, and ethnicity are the most studied primary social identities. However, race and ethnicity are inseparable from culture, making it critical to understand how it influences women's experiences as it converges with their other subordinate social identities. Age is not mentioned at all, and this study argues that understanding its intersectionality is critical to the retention of women in STEM, and most importantly, to the strategies aimed at positively influencing women's experiences in STEM.

3.17 AGEISM: WORKPLACE SUPPORTS THE OLD AND NEGLECTS THE YOUNG

> *Over the past few weeks, we've seen young people in every corner of the country step up and become leaders. Through organization and mobilization, they're showing us how we can sustain this momentum to bring about real change* (@BarackObama, 1 June 2020).

Age as a social identity has received very little attention in both leadership and intersectionality studies, compared to other social identities (Katz, 2014; Kelan, 2014). Where it has been recognised as a subordinate social identity, the focus is mostly on the challenges of the elderly, particularly those faced with retirement or unemployment (Thomas et al., 2014; Colgan & Tomlinson, 2014; Kelan, 2014). Thomas et al. (2014) advocate the need to study and understand age, as individuals', organisations' and societies' current interpretation of age is problematic. The naturalisation of different ages creates age stereotypes in the workplace, consciously or unconsciously. Age stereotypes favour some members of the organisation while marginalising those outliers who do not fit the stereotype of the ideal leader, either because they are too young or too old (Spedale, Coupland & Tempest, 2014). Thomas et al. (2014) assert that age can be used to classify people, with young people glorified and older people considered to have diminished, creating discomfort and anxiety among the elderly whose age is regarded as "decline" (Colgan & Tomlinson, 2014). Spedale, Coupland and Tempest (2014), however, argue against the gendered nature of the concept of ageism.

Most of the intersectional studies acknowledge age, race and culture as subordinate social identities, but none of them analyse how age defines people's organisational experiences (Gilleard & Higgs, 2013; Kelan, 2014). Almost all the studies that have been reviewed mention age, but they proceed to analyse other social identities in more detail, as if age is not significant. Unfortunately, organisations are not age neutral (Spedale, Coupland & Tempest, 2014). Age, depending on one's culture, can be seen as an advantage as one is considered to have amassed wisdom through the years, or dismissed as having evolved to be childlike (Yuval-Davis, 2006; Spedale, Coupland & Tempest, 2014).

Although most countries outlaw discrimination on the basis of age or gender, it continues to happen around the world (Krekula, 2007; Jyrkinen & McKie, 2012; Spedale, Coupland & Tempest, 2014). In the same way race advantages men, age is also gendered against women's promotability in the workplace (Kelan, 2014; Spedale, Coupland & Tempest, 2014). While advanced age is onerous for women in employment, men of the same age have a positively opposite experience. Men's advanced age is lauded as wisdom, making them suitable for leadership positions, while women start experiencing gendered ageism at a much earlier age than men (McAdam & Marlow, 2013). Women's age is associated with loss of skills and energy (Jyrkinen & McKie, 2012). While individuals in advanced age are encouraged to self-employ in order to remain self-sufficient, women in the same age bracket struggle with social discourses that dismiss women's business acumen across all ages (Colgan & Tomlinson, 2014). Entrepreneurship, like all leadership roles, is stereotyped as a male forte. In the event where the business is run by a heterosexual couple, the man assumes the leadership role and the wife assumes the support role (McAdam & Marlow, 2013; Petitt, 2016). It is worth noting that the stereotype makes it more burdensome for the women than their male counterparts to gain some kind of recognition, and those who "reject" the stereotype also have to work much harder than their male counterparts to prove themselves.

Jyrkinen and McKie (2012) introduce yet another dimension of ageism suffered by women in leadership, called lookism, described as appearance-based discrimination. Women's looks are deemed important to women's position and ability to be taken seriously, while men's leadership position often makes up for their looks. Women's looks therefore converge with their advanced age and gender negatively, as opposed to their male agemates (Wilcox, 1997).

Age is commonly defined generationally, with people falling within the same generation, like baby boomers, generation X, millennials and generation Z, painted with the same brush (Weiss and Lang, 2012; Thomas et al., 2014). Such a reductive way of generalising generational difference ignores other social identities converging with age, like culture and gender. Generationally, older people and younger people do not experience life the same way, and their gender further influences those experiences. Backes-Gellner and Veen (2013) argue for an age diverse workforce in industries where innovation is important, such as STEM. While younger employees, both male

and female, bring more current education and technology, male and female older employees bring social experience. Thomas et al. (2014) argue for the need to study ageing employees' work environment, age, and gender, to understand how they influence their work perceptions and experiences.

The number of ageing female employees in America increased from 40% in 1990 to 50% in 2004. This trend has been influenced by the shift from the socio-cultural expectations that women become stay-at-home mothers when they start having babies (Cleveland & Huebner, 2017). Ageing employees should not be treated as a homogeneous group the way generational classification treats employees, because their experiences are further influenced by their differences in age, race, gender, social and organisational culture, as well as social and economic status (Cleveland, Hanscom & Huebner, 2017).

This study acknowledges the inadequacies in intersectionality studies on race and gender involving the ageing workers. It however elected to study the way age, gender and culture converged to influence the experiences of young female STEM workers, as an area that has been neglected. Scharff (2011) posits that failure to recognise young age as a subordinate social identity has caused young women to associate it with not being taken seriously at work. Some participants in Scharff (2011) argued that gender was less of a challenge than young age. This study therefore considered that women in STEM had been increasing in recent years, while most of those that would be considered among the ageing had left the field and were ageing elsewhere. Furthermore, the study acknowledges the fact that most of the studies on the effects of gender and age on leadership gravitate towards the ageing population, ignoring the need of the younger women to feel recognised as a retention strategy. Women at the beginning of their careers are equally disadvantaged as women at the end of their careers, age-wise (Jyrkinen & McKie, 2012).

One respondent in a study by Jyrkinen and McKie (2012) argued that she was rejected because she was both young and a woman. Culture arises as a contributer to the lack of respect for younger women in leadership positions by their direct reports, because in Finland women are referred to as girls in a derogative way, irrespective of age. One of the middle-aged respondents said her decisions were often challenged by her older male juniors. Age-based gender discrimination in

Finland even has a name, tytöttely, which is a word used to refer to girls who are not in full control of themselves (Jyrkinen & McKie, 2012). This convergence of age and gender in leadership has also been problematised in the African culture (Ncube, 2018), as well as in STEM (Miner et al., 2019).

Younger women do not necessarily struggle with employability. However, they experience subtle discrimination when they attempt to pursue career progression because of their child-bearing age (Kretschmer, Pudovkin & Stegmann, 2011; Kay, Alarie & Adjei 2014), including younger women in STEM (Miner et al., 2019). Social and cultural expectations are that all women of child-bearing age will have children, and as such, they will start spending too much time away from work taking care of their families, rendering them unpromotable (Kelan, 2014; O'Connell & McKinnon, 2021). In some instances such frustrations lead to women leaving the industry completely, and this is how STEM ends up failing to retain women (Bilimoria, Lord & Marinelli, 2014; Nowak et al., 2014; Hunt, 2015). Women may be tempted to move to industries less male dominated with the hope of a less judgemental work environment with better opportunities (Turk-Bikakci & Berger, 2013; Tandrayen-Ragoobur & Gokulsing, 2022).

The culture of the society in which the organisation exists does play a central role in the way gender-based age discrimination manifests, as illustrated by Jyrkinen and McKie (2012) in a comparative study of Finland and Scotland. While the discrimination was more brutal in Finland, a more gentle and subtle version of discrimination was noted in Scotland. The setting of this study is an African country where advanced age is considered a sign of wisdom, hence the need to study age as a defining factor in women's perceived leadership ability and opportunity in STEM. The next topic therefore investigates culture and intersectionality.

3.18 WHAT THEN OF ORGANISATIONAL AND NATIONAL CULTURE?

Culture can be either national, organisational or industry inclined. Industry culture is influenced to a large extent by national culture, as the people who work in that industry would have experienced national culture before they gained knowledge of industries (Preston, 2013; Lee, 2019). Industries are made up of people from different cultures which are fused together into one, resulting in one dominant industry culture (Canham, 2014; Lee, 2019). Zander et al. (2010) studied

the intersection of culture among other social identities such as language, nationality, and gender in multinational companies. Organisational culture is formed as a result of the dominant cultures of the people working in an organisation, as well as the influence of the positions they hold (Zander et al., 2010; Hassan, Faiz & Iqbal, 2017; Dutta, 2018).

In the African culture, men are providers and leaders of households, while women are homemakers and followers of the men (Canham, 2014; Helman, Kaminer & Malherbe, 2018; Okpokwasili, 2023). It is critical to note that societal values and expectations perpetuate gender role stereotypes in a culture and mandate males to be "masculine" and females to be "feminine" (Moiz, 2012; Moswete & Lacey, 2015).

In the workplace men are privileged, as social culture extends into workplaces and influences organisational culture; expectations of women's capability are placed on the same social scale (Loubier & Richardson, 2008). Asian culture emphasises modesty, humility and peace (Carrim & Nkomo, 2016; Dutta, 2018) instead of assertiveness, self-praise and competitiveness, while in American organisational culture those values are often rewarded (Davis & Sanchez-Hucles, 2010; Martin & Phillips, 2017). Ethnic minorities feel pressured to assimilate and leave their culture at the door to fit into their organisation's culture (Atewologun, Bebbington & Showunmi, 2016; Dutta, 2018). Those who fail to comply risk serious repercussions, as they are judged on stereotypes associated with their culture (Atewologun, Bebbington & Showunmi, 2016). On the other hand, those who make it into leadership positions are still stereotyped as female influencing their further career progression opportunities negatively (Atewologun et al., 2016).

Intersectionality in leadership therefore recognises the fact that social identities are viewed as natural truths to the extent that even the disadvantages are to be expected.

3.19 HOW CULTURE FOLLOWS WOMEN TO THE WORKPLACE

Culture creates meaning through which individuals interpret their experiences and guide their actions (Geertz, 1973). Culture can be of a nation or an ethnic group (social culture), an organisation or an industry. About two decades ago I attended a funeral at a village not very far from her village. Funerals in Botswana usually start at 5:30 and because it was that of a relative,

she' had to arrive early. Those who arrive early often find chairs to sit on while those who arrive late are forced to stand or sit on the dirt ground if they do not bring their own chairs. Because of their early arrival, they were able to get chairs to sit on. Suddenly, as more and more people arrived, the master of ceremonies announced, sternly, that all women who were occupying chairs should surrender their seats to men who were standing and sit on the dirt ground because it was not cultural for men to stand while women were sitting on chairs.

Social culture defines the social norms and values of a group of people who identify themselves as one based on a specific social identity. African culture recognises that the man is the head of the household and as such, the provider, and the woman is a "child" and therefore a dependent (Helman, Kaminer & Malherbe, 2018; Dosekun, 2022). This is a historical part of the culture influenced by the time when Botswana men were migrant workers in South African mines or factories. While the men would only return home to their families with scarce store-bought goods from their hard-earned dues once a year, the women would have been toiling on the farm to sustain the family. However, the woman's hard work was not recognised or respected like the man's as it was mostly unpaid "domestic" work (Barker & Bergeron, 2017). Such a culture has a negative effect on African families when it converges with unemployment and poverty, as the unemployed father is made to feel like a failure when he is unable to provide for his family (Helman, Kaminer & Malherbe, 2018). African men in such situations often find it difficult to handle the pressure, even if the wife may be in a better position to provide for the family (Helman, Kaminer & Malherbe, 2018).

Where the mother provides for the family, she is said to be playing the role of the father. On the other hand, fathers who are not financially able to support their families are dismissed as lazy and irresponsible (Helman, Kaminer & Malherbe, 2018). For a husband to stay home and care for the family while his wife is engaged in paid work is an abomination. It therefore affects the men negatively as they also view themselves as failures, the way others view them, at the intersection of their gender, culture and unemployment (Mordi et al., 2010; Helman, Kaminer & Malherbe, 2018).

Mordi et al. (2010) argue that Nigerian female entrepreneurs struggle, not because they are incapable but because of the influence of the social culture that dictates their role in society. Women are excluded from key networks (Atewologun, Bebbington & Showunmi, 2016), which affects their self-confidence and credibility, making it difficult for them to raise the required finances to compete fairly with their male counterparts. In comparing the Nigerian female entrepreneurs to female entrepreneurs in the UK, Mordi et al. (2010) acknowledge the similarity of challenges faced by women with families in both contexts and cultures. They do highlight the fact that some banks in Nigeria have gendered loan facilities that systematically exclude female in favour of male entrepreneurs, which is not the case for women in the UK. While both sets of women are not recognised as serious entrepreneurs based on their gender, women in the UK have better opportunities. Although there are similarities across racial contexts in terms of gendered challenges encountered, there are major differences influenced by depths of cultural and patriarchal values (Mordi et al., 2010).

Despite existing in the same patriarchal world, White men do not feel emasculated when they have to stay at home while their wives are working and providing financial support (Lee & Lee, 2018). The work the wives do at home is also culturally recognised as important work, and hence any party doing it feels valuable. In an op-ed, the first American woman Director of Policy Planning at the U.S. State Department, feminist Anne-Marie Slaughter, detailed her personal struggles. Her transition from an academic job which allowed her flexibility to be in control of her schedule as a full-time working mother to her demanding job in the State Department was daunting (Slaughter, 2012). A notable cultural difference from the African culture above is that her husband was supportive, opting to take full responsibility for parenting duties. There have been other women who were followed by culture to their workplaces. Women such as Karen Hughes who was President Bush's counsellor, Mary Matalin who was President Bush's assistant and Michele Flournoy who was Under Secretary of Defence in 2012 sacrificed those important and powerful positions in the US Government to spend more time with their families (Slaughter, 2012) because "it is the role of a woman" to be a homemaker (Mbuli & Fletcher, 2018).

While some women still hold on to the socio-cultural belief that fathers cannot be as good with the children, others like Sheryl Sandberg, the Chief Operations Officer of Facebook, is proud of

her husband who is in academia and therefore has a more flexible work schedule and is able to spend more time at home with the children (Slaughter, 2012). James Steinberg, former US Deputy Secretary of State and William Lynn, Former US Secretary of Defence, both in Former President Obama's administration, stepped down because they wanted to spend more time with their families. Chris Christie decided to withdraw from the U.S. presidential race in 2012 because his son missed him every time he was away (Slaughter, 2012). What is common to Sheryl Sandberg's husband, Chris Christie, William Lynn, and James Steinberg is that they are all White men, and their cultures are similar. As opposed to the culture of the Black men implied in Mordi et al. (2010) and Helman, Kaminer and Malherbe (2018), the culture of the White men allows them to choose family over employment without feeling emasculated. Such ethnic or national culture influences organisational culture through the perception of men in the workplace, as they continue to believe that all women are below them (Mahadevan, Mayer & Surtee, 2018). That includes the notion that female employees are less able than male employees, irrespective of the positions they hold.

Racial or ethnic culture, as well as organisational culture, determines who should be respected or trusted as a leader, depending on whether they are prototypical or not (Atewologun, Bebbington & Showunmi, 2016). Although Atewologun, Bebbington and Showunmi's (2016) study primarily focused on ethnicity, gender, religion and class, ethnic culture strongly showed up among the ethnic minorities' definition of leadership and self-perception as leaders, which was non-existent in White women's experiences. While White women identify gender and class as barriers to their career progression, Black and Asian women struggle with gender, ethnicity, ethnic culture, religion and organisational culture as converging factors that influence a stereotypical dismissive attitude towards their ability as leaders (Atewologun, Bebbington & Showunmi, 2016). While Black women emphasise race, Asian women identify ethnic culture and religion as their primary sources of discrimination; these are used to dismiss their capabilities in the workplace (Atewologun, Bebbington & Showunmi, 2016). Yuval-Davis (2006) calls that naturalisation of a group's social identity, where common belief becomes the universal truth for the rest of the members of the group.

3.20 CONCLUSION

The literature review demonstrated how a woman's place in communities, from social to professional, relied on combined efforts and advocacy, from feminist (Baxandall & Gordon, 2005, 2013) and intersectional studies (Crenshaw, 1989; Davis & Sanchez-Hucles, 2010; Holvino & Ruiz Castro, 2016; Okpokwasili, 2023). It unpacked how women's subordinate social identities converged and dictated the way women experienced life, including their leadership roles (O'Bannon et al., 2010; Moorosi, 2014). The literature showed that perceptions of women's leadership abilities by both the self and others hinged on their gender and other subordinate identies (Derks et al., 2012; Erichsen et al., 2020). The literature revealed how women in STEM leadership were similarly heavily burdened by their gender and culture (Adams et al., 2014; Cabay et al., 2018). Very few studies analysing the impact of age on younger women in STEM were located. The next chapter discusses the research process used by this study.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter details the research methodology used in the study, following the research onion. The research philosophy and approach underpinning the study are presented. Constructivist grounded theory is discussed as the research strategy, together with the data collection and analysis process.

4.2 RESEARCH PHILOSOPHY

The research philosophy is foundational to the study, describing the set of beliefs the research is built upon (Zukauskas, Vveinhardt & Andriukaitienė, 2018). The research philosophy or paradigm refers to the researchers' worldview influencing their choice of research methodology (Creswell, 2014; Lewis et al., 2016). There are four main philosophies, namely positivism, pragmatism, interpretivism and realistic research philosophies (Saunders, Lewis & Thornhill, 2015; Zukauskas, Vveinhardt & Andriukaitienė, 2018).

Research philosophies are underpinned by different philosophical assumptions that drive decision making in research. These can be based on assumptions concerning the realities the researcher encounters and is able to know and understand during the research (ontological assumptions), or on how human knowledge is obtained and understood (epistemological assumptions), or on ways in which the researcher's own values influence the research process (axiological assumptions) (Lewis, Saunders & Thornhill, 2015; Saunders, 2017). Rhetorical assumptions are embedded in the style of writing which can be conversational, based on the data collection and reporting process (Charmaz, 2006; Polkinghorne & Given, 2021; Bouvier, 2023).

This study was interpretivist, as it depended on meanings created by the participants from their different standpoints, both as groups and individuals (Lewis, Saunders & Thornhill, 2015; Sebastian, 2019). It was underpinned by the ontological assumption that data are socially and culturally constructed and not just naturally occurring to be discovered (Cronin, 2017; Sebastian, 2019). Interpretivism assumes that knowledge cannot be generalised, as different individuals and groups of people experience life differently, depending on their social or political standing (Sebastian, 2019; Polkinghorne & Given, 2021). For instance, participants' political stances on gender issues and the influence of religion in their sense making were evident.

The paradigm recognises the differences in the lived experiences of men and women in the workplace and the subsequent differences in interpretation and meaning (Lewis et al., 2016). For

instance, one participant shared her friend's experience where they were made to calculate plumbing on a construction site she worked at. The woman did not take kindly to the assignment, as she thought it was beneath her engineering status and was only assigned to her because of her gender. Whether that was the true motivation of the assigning supervisor or not, it was a true experience of disrespect by the woman, and she resigned from the job. It therefore epistemologically relies on individual narratives and interpretations in the construction of truth (Lewis, Saunders & Thornhill, 2015). The perceptions of women in STEM leadership are critical to the conceptualisation of the women's experiences as they influence their decisions. As such, they become part of the phenomena being studied, as their social identities define their construction of the phenomenon (Lewis, Saunders & Thornhill, 2015). All the participants believed that they were being treated differently by their subordinates, while their male counterparts were visibly respected.

Women in the male-dominated STEM leadership have a different analysis and interpretation than their male counterparts benefiting from the status quo. The study used intersectionality as a lens to understand the experiences of women in Botswana STEM leadership. This is linked to the women's observations and constructions of truth, which may also differ depending on the context within which they occur (Morse, 2015; Polkinghorne & Given, 2021) or the power they possess (Lewis, Saunders & Thornhill, 2015). For example, the same superior identities that intersect positively for men in leadership, intersect negatively for women in leadership generally (Amaratunga, Haigh & Shanmugam, 2017; Goian & Storozhuk, 2017) and in STEM in particular (Moss-Racusin et al., 2018; McCullough, 2020), due to the stereotypic association of masculinity with both leadership and STEM. The study, however, acknowledged the fact that different women in STEM leadership might have different interpretations of the same phenomenon, as previously alluded to in the queen bee and tokenism discussions. Interpretivism was therefore appropriate to underpin the study as it was concerned with how the participants thought and felt about their leadership experiences in the STEM sector in Botswana. The study relied on the collection of rich data oriented to the contextual uniqueness of participants' interpretation of their own experiences (Given, 2008; Morse, 2015). For example, one of the participants shared how she preferred to allow her male colleagues to lead conversations while she played a supporting role. On the other hand, some participants considered that mansplaining or dismissing.

4.3 RESEARCH APPROACH

There are three different research approaches, namely deductive, inductive, and abductive (Lewis et al., 2016). This study used the inductive approach, also known as the bottom-up approach (Bryman, 2012; Lewis et al., 2016). The approach is commonly associated with qualitative research (Lewis, Saunders & Thornhill, 2015). It is also a good fit for the constructivist grounded theory strategy used by the study as it starts with the collection of rich raw data. In addition, intersectionality supports the inductive research approach as it depends on collecting data from different individuals and putting it into a theoretical framework in the same manner that constructivist grounded theory operates (Singh, 2006; Yamaguchi & Burge, 2019). Quotations from the participants' interviews were analysed and synthesised with relevant literature, towards the development of a conceptual framework.

4.4 RESEARCH STRATEGY

Research strategy reflects the general plan of how a study's research questions are answered, including procedures for collecting and analysing the data (Lewis, Saunders & Thornhill, 2016; Creswell & Creswell, 2018). Different research strategies are applicable in qualitative research, such as archival and documentary research, case study, ethnography, and grounded theory (Lewis et al., 2016). This study used constructivist grounded theory research (Charmaz, 2017; Rakhmawati, 2019). Constructivist grounded theory is a research approach for developing theory that is grounded in data systematically gathered and analysed (Creswell & Creswell, 2018). It is a qualitative procedure used to systematically generate a theory that explains processes, actions and experiences conceptually (Charmaz, 2017; Rakhmawati, 2019). Charmaz (2013) asserts that grounded theorists develop theory in a theoretical manner, and not the regular theory. It is the most suitable research strategy for this study as it focuses on people's interpretation of their positions, situations, environments, and how the power dynamics around them are influenced by their standpoints (Charmaz & Bryant, 2010). That has been articulated in the conceptual framework. It depicts the participants interpretation of their gendered experiences, as well as the resulting psychological fallouts, and how the power dynamics intersectionally act in unison against them.

4.4.1 The evolution of grounded theory

Grounded theory was originally developed by Glaser and Strauss in 1967. It was developed to counter the common notion, at the time, that theory always revealed a pre-existing reality in social sciences, independent of human interpretation or comprehension (Charmaz, 2006; Lewis, Saunders & Thornhill; 2016; Marshall & Rossman, 2016). Charmaz built on the strengths of both

the Glaserian and Straussian versions, such as the constant comparison from Glaserian and axial coding from Straussian grounded theory, and introduced her constructivist grounded theory in 2004 (Lewis et al., 2016; Marshall & Rossman, 2016).

Constructivist grounded theory focuses on the meanings derived from the data collected, through expressed values, beliefs, feelings, assumptions and ideologies shared by participants as they experience a phenomenon (Creswell & Poth, 2018; Flick, 2018). It differs from Glaserian and Straussian grounded theories. Strauss's grounded theory is more interpretive than Glaser's which is more positivist. Unlike the other two types that believe that theory occurs on its own, waiting to be discovered, Charmaz's grounded theory allows the researcher to co-construct data with the participants (Charmaz, 1996, 2017; Sebastian, 2019). In constructivist grounded theory, therefore, "data reflect the researcher's and the research participants' mutual constructions" (Charmaz, 2003: 678).

Constructivist grounded theory relies on follow-up questions to the initial open-ended questions to solicit participants' definitions of terms, situations, events, assumptions, and implicit meanings. For example, the participants sometimes seemed unsure of how much to divulge. Further probing allowed participants to clearly articulate their experiences and interpretations of the conjunction of the STEM industry culture and their social culture. For example, *one of the questions asked was to what extent has the STEM sector culture impacted your experiences as a leader.* Most of the participants gave brief positive answers, until I probed them to share *any positive and negative personal experiences*. That probing question prompted them to dig deep and share their experiences unreservedly, despite having previously claimed that the environment was supportive.

Just like intersectionality, constructivist grounded theory depends on meaning making of those who have experienced the phenomenon being studied (Charmaz, 2017; Windsong, 2018). In the same way that social identities are socially constructed and not naturally occurring, constructivist grounded theory depends on the social construction of knowledge (Charmaz, 2017; Windsong, 2018). Intersectionality relies on the collection of rich data from participants to gain in-depth understanding of their lived experiences. Charmaz's constructivist grounded theory research design was therefore the most suitable for this study as it gave the participants the opportunity to share their lived experiences through their own story through their own voices. The application of constructivist grounded theory in the current study is discussed in more detail in the sampling, data collection and data analysis section.

4.5 METHODOLOGICAL CHOICES

Research can be carried out using either qualitative, quantitative or mixed methods (Khaldi, 2017; Schyns, Hall & Neves, 2018). Quantitative research methods were not suitable for this particular study as they focus on establishing frequency and generalisability of research findings, without in-depth understanding of the lived experiences of research participants (Schilling, 2017; Schyns et al., 2018). Qualitative research methods, on the other hand, acknowledge individuals' unique truths while quantitative research will only accept it as true if it occurs frequently enough to be generalised to a larger population (Creswell & Creswell, 2018). This study used qualitative research as it sought to explore the lived experiences of women in STEM leadership. Qualitative research allowed the participants of the study to guide the data collection process as they revealed new insights during data collection (Schilling, 2017; Schyns, Hall & Neves, 2018). I therefore used those insights as leads to identify more research participants (Bogdan & Taylor, 1984; Charmaz, 2006; Creswell & Poth, 2018). For instance, only the younger participants complained about sexual harassment, while the older participants considered it a non-issue.

Nastasi and Schensul (2005) point out that qualitative research enables an exploration of the contextual factors that support or obstruct gender transformation in STEM. While some of the participants shared struggles with work-life balance, it was generally due to either care-giving issues or the biological clock. The qualitative nature of the study therefore allowed for the diversity to be captured.

Windsong (2018) attests to the methodological compatibility between qualitative research and intersectionality. Intersectionality recognises individuals' experiences, while qualitative research empowered me to pursue by following data shared by the participants in response to the initial open-ended interview questions. While the participants generally agreed that the social patriarchal culture affected them negatively, they reacted differently to it. Some embraced it as a natural part of their lives while others actively resisted it.

Qualitative research methods give a voice to the usually silenced as their experiences are captured as rich data, which are then used in the conceptualisation of the phenomenon being studied (Creswell & Poth, 2018; Windsong, 2018). While some of the participants were happy to share their experiences, there was one in particular who had left the STEM sector and had vowed never to have anything to do with STEM again. As a result, convincing her to participate was more

challenging, as she believed that she did not have any valuable data to share. However, her work-life balance challenges were quite rich and peculiar as she was the only one who had care-giving struggles, which resulted in her quitting STEM.

The rich data collected were critical in guiding the development of transformation strategies towards resolving the persistent problem of having a disproportionate number of women in STEM leadership positions (Nastasi & Schensul, 2005). Women were able to share their lived experiences and how they were influenced by their subordinate identities through in-depth qualitative interviews (Windsong, 2018). For instance, one participant said that she was constantly overlooked for promotion despite being the only one always given important assignments in the organisation.

The STEM industry culture strategically silences women by defining the sector in masculine terms (Ong et al., 2011; Pringle et al., 2017). For example, the culture of presentism makes it difficult for women to gain recognition for their efforts at work as they either have to or are expected to be homemakers (Carter, Prime & Welbourne, 2009; Smith-Doerr et al., 2019). Women who sacrifice family and place their careers first are dismissed based on societal expectations (Dutta, 2018), the same way as those that have families (McCullough, 2020). The subtle genderisation of STEM is influenced by national culture (Dutta, 2018; Johnson, Widnall & Benya, 2018). Qualitative research enabled me to look into cultural and contextual factors that support or obstruct the effectiveness of the strategies to improve the experiences of women in STEM (Nastasi & Schensul, 2005). For instance, some of the participants worked in an organisation with a gender inclusion policy. However, those who benefitted from that policy were dismissed as nothing more than affirmative action props.

4.6 TIME HORIZON

Time horizon is determined by the purpose of the study as well as time available to conduct the study. It can either be cross-sectional or horizontal (Saunders, Lewis & Thornhill, 2007; Lewis, Saunders & Thornhill, 2015; Creswell & Creswell, 2018). Academic studies are cross-sectional as they have to be completed within the duration of the learning programme, while longitudinal studies are conducted over a long period of time, in order to observe or measure change over a long time (Lewis et al., 2016; Creswell & Creswell, 2018). Due to the doctoral study programme duration constraint, this study was cross-sectional. Although the cross-sectional time horizon was

relatively adequate for this study it would have benefitted from a longitudinal study, as the phenomena would have been observed over a period and in real time.

4.7 STUDY POPULATION AND SAMPLING

A study population is defined as the general group of entities sharing a common set of characteristics (Edition, 2014; Creswell & Creswell, 2018). The target population for this study was current and past women leaders in the Botswana STEM sector. That included women in middle management and in executive management positions.

4.7.1 Sampling strategy

A sample is a part or a subset of the whole population (Edition, 2014). Sampling therefore enabled me to estimate some unknown characteristics of a specific population (Leedy, Ormrod & Johnson, 2014; Marshall & Rossman, 2016). There are different sampling strategies such as maximal variation, critical, homogeneous, extreme case, purposive and snowball sampling which can be used, depending on the purpose of the qualitative research (Creswell, 2008). This study adopted purposive, snowballing, and theoretical sampling (Flick, 2014; Leedy & Ormrod, 2015).

A total of twenty participants were selected using purposive sampling, snowball sampling, and theoretical sampling. Purposive sampling was used to sample participants (7) who were best suited to contribute to the study (Lewis et al., 2006; Schyns et al., 2018). Purposive sampling presented the opportunity to intentionally select participants who fit the criteria pre-determined for the study, in this case being women in Botswana STEM leadership (Bryman, 2012; Gentles, Charles, Ploeg & McKibbon, 2015). As a STEM graduate, I used my professional connections to identify the initial sample of participants.

Snowball sampling, also considered a type of purposive sampling, was further used in conducting the study (Family Health International, 2012; Parker, Scott & Alister, 2020). Snowball sampling provided the opportunity to locate relevant participants (12) by following leads from other participants, as well as other individuals that were encountered during the research (Creswell, 2008; Etikan, Alkassim & Abubakar, 2016).

Theoretical sampling refers to sampling based on emerging concepts to prove theoretical relevance to the evolving theory (Lewis et al., 2016; Morgan, 2020). The participants were chosen based on their relevance to themes and categories emerging from the constant comparison (Alemu et al.,

2015) towards the evolving of theory (Lewis et al., 2016; Charmaz, 2017; Morgan, 2020; Foley, Timonen, Conlon & O'Dare, 2021). One (1) Participant was theoretically sampled following a theme that emerged from an interview with another participant.

4.7.2 Sample size

Constructivist grounded theory recommends between 20 and 30 research participants (Creswell & Creswell, 2018), specifying that the researcher only needs to stop sampling when having reached saturation (Glaser & Strauss, 1967; Charmaz, 2006). Some researchers propose a minimum of 25 interviews while silent on the number of participants (Gentles et al., 2015). I however concur with Cunningham and Carmichael (2017) that it was rather about the interviewer's ability to draw the best data out of the participants towards theoretical saturation. A total of nineteen women with lived experiences in STEM leadership, both current and past, were sampled, as well as one who had no leadership experience despite having extensive work experience in the sector. I followed emerging concepts and proceeded to sample participants that were more relevant to the identified themes and categories to expand on the theoretical discovery (Morgan, 2020) or theoretical sampling. For example, one participant spoke highly of the young women members of an association she belonged to, and I sampled two of them to check what made them special. As young women leaders they were able to stand up for themselves whenever they felt as if they were being oppressed, associating that with the mentorship they got from the older members of their associations, both male and female. The final sample size of 20 was informed by theoretical saturation as discussed in detail earlier in the chapter.

Table 4. 1: Study Sample

Sample category	Above 35 years	35 years and under	Total
Women holding STEM leadership positions	10	5	14
Women in STEM non-leadership positions	1	0	1
Women who left STEM leadership positions	2	0	2
Women who left before holding STEM leadership positions	2	0	2
Total	15	5	20

The United Nations regards those between the ages of 15 and 24 as youth, while Botswana legally recognises 35 years as the age limit of youth. This study uses the Botswana definition. Initially the intention was to sample only women in senior and top leadership for the study. However, during

sampling it became evident that younger women would be excluded due as the women generally got promoted at a slower rate. Therefore, the sample composition was broadened to include middle-level managers.

4.7.3 Criteria for inclusion and exclusion

All participants were required to have experience in STEM leadership. However, one participant with no STEM leadership experience was sampled following an emerging theme , making her experiences valuable to the study. Although the ideal level of leadership for engineers would have been senior engineers, project engineers were also sampled as they provided direct leadership in the projects. That was also in response to the challenge in finding senior engineers under the age of 40 years. Participants who were younger than 40 years of age needed to be included in order to capture the young age perspective, as age was one of the social identities being researched by this study. Women with both private and public sector experience were sampled.

Women with obvious privileged connections were excluded, as they were likely to be outliers. For example, women working in their family businesses often have accelerated progression, contrary to the experiences of ordinary women in STEM leadership (Creswell & Creswell, 2018).

4.8 DATA COLLECTION

Data collection refers to the stage of collecting data on a particular phenomenon from the identified participants (Leedy & Ormrod, 2015; Marshall & Rossman, 2016). This study used open-ended semi-structured one-on-one interviews (Charmaz, 2006; GetanehAlemu et al., 2015). Charmaz emphasises the importance of starting with open-ended questions relying on the study areas of interest to enable the participants to share their concerns and guide the rest of the process of construction of knowledge (Charmaz, 2003, 2006). I endeavoured to build trust to make the participants comfortable and open to sharing their experiences (Marshall & Rossman, 2016). “Semi-structured focused questions” (Charmaz, 2006: 26) were used to pursue emergent themes, with follow-up probing questions to explore themes emerging from the open-ended questions (Charmaz, 2006). Data were collected in what is called a zigzag data collection and analysis fashion (Lewis, 2016). That is where data are collected and analysed with questions refined, a process known as emerging design (Lewis, 2016). The process was repeated iteratively until reaching the state of theoretical saturation (Corbin & Strauss, 1990; GetanehAlemu et al., 2015).

The in-depth semi-structured one-on-one interviews used open-ended interview questions (Charmaz, 2003, 2006). Open-ended interview questions enable the participants to tell their own story with minimum intrusion (Charmaz, 2003; Lewis et al., 2016; Creswell, 2018). The interviews started with a pilot of 2 interviews which led to the actual one-on-one interviews. The pilot studies were used to measure the quality of the interview guide. Although the interviews were scheduled for a minimum of 1 hour 30 minutes, they lasted an average of 58 minutes. I struggled to a certain extent with probing questions as those depended on the participants' responses and could therefore not be anticipated. Since the interviews were recorded, with the participants' consent, I had the opportunity to play them back and identify my weaknesses. I realised that the questions did not work as well as they did not yield as much data as I had expected. The participants answered briefly, and I could not proceed. For example, one of the questions was, *In terms of gender representability at leadership levels, how well do you think the STEM sector in Botswana is doing?* As a result, I added follow-up questions such as *If the answer suggests male dominance ask, In your view, what contributes to the continuing male dominance? and ask for examples.* The conversational nature of the interviews allowed the research participants to share their personal experiences freely (Bryman, 2012). It also allowed probing of the responses further as relevant interesting data came up during the interviews (Schyns et al., 2018). The interview sessions took between 1 hour 30 minutes and 2 hours. Written consent was sought from the participants prior to the interview sessions for their participation and for the interviews to be audio recorded (Alemu et al., 2015; Zukauskas, Vveinhardt & Andriukaitienė, 2018).

I transcribed interviews after every 2 interviews to avoid mixing data from different interviews (Saunders, Lewis & Thornhill, 2007). She personally transcribed the first ten interviews to maintain consistency and limit discrepancies while ensuring rigor and trustworthiness (Seale, 1997). While time consuming, doing her own audio interview transcriptions further enhanced her data immersion and intimacy. It also helped ensure confidentiality of the research participants. A transcriber was later engaged who had to sign a confidentiality form to ensure confidentiality of the research participants before transcribing the remaining interviews. Rigor is discussed in detail later in the chapter.

4.8.1 Data analysis

The constructivist grounded theory data analysis process was used for this study. It involved the use of coding, constant comparison, theoretical sampling, theoretical saturation and theoretical sensitivity as data analysis tools (Bryman, 2012; Bryan, 2016). The data were analysed throughout

fieldwork. This was because constructivist grounded theory requires continuous back and forth analysis of data throughout the process to identify emerging themes, patterns, and relationships (Creswell, 2008; Lewis et al., 2016; Charmaz, 2017). Data collected were grouped according to frequently occurring and significantly missing concepts and categories identified during coding. Further analyses and constant comparison were done, with the focus on ensuring that data collected were specifically relevant to the development of a theoretical framework (Charmaz, 1996; Lewis et al., 2016). ATLAS.ti data analysis software was used.

4.8.2 Coding

Coding is the labelling of data within a data item to categorise them according to similar meanings (Bryman, 2012). It includes references to actions, behaviours, beliefs, conditions, events, ideas, interactions, outcomes, policies, relationships, and strategies (Bryman, 2012). A code can be either a single word or a phrase (Lewis, Saunders & Thornhill, 2015; Schyns et al., 2018). The groups of codes are distinguished by being labelled with numbers (Charmaz, 2006; Bryman, 2012).

Since this study applied constructivist grounded theory, initial, focused and theoretical coding were used (Charmaz, 2006; Lewis et al., 2016). During initial coding, line-by-line coding resulted in 384 codes, most of which were mundane as I was making meaning of the data. Some of the initial codes were in-vivo from the compelling words of the participants (Adu, 2023). For example, one participant said, *"I would say I am a forewoman!"* in protest to her all male subordinates whenever they called her shift foreman when she worked as a mining engineer. I found that statement interesting as it showed the non-inclusive nature of STEM environments, and the helplessness of the women. Focused coding was applied to synthesise the line-by-line coded data into focused codes, identifying codes that were more significant than others (Charmaz, 2006; Sebastian, 2019). Some of the codes were put back while others were dropped as they seemed less significant. Some of the initial codes were further merged due to their similarities or closeness. The deeply engaging iterative data analysis process resulted in reducing the 384 initial codes to 64 focused codes. Subsequently, theoretical coding was used to further group related core categories into 6 themes and 11 subthemes. Some of the in-vivo codes were adopted as sub-themes in theoretical coding. For instance, one participant shared her sentiments that *"Even if you are a woman leader at work, you cannot disregard culture."* This was a significant statement coming from one of the highly respected women in Botswana STEM industry, especially as it summed up the cultural discourse, that men lead, and women follow.

4.8.3 Constant comparison

Constant comparison, the one common and constant tool across all types of grounded theory, involves the constant back and forth analysis of data (Glaser & Strauss, 1967; Charmaz, 2006). It includes ongoing assessment of categories and concepts to identify their similarities and differences (Charmaz, 2006; Bryan, 2016). Constant comparison leads to the emergence of the theoretical elaboration of the different identified categories (Glaser & Strauss, 1967; Bryman, 2012) towards a systematic development of the conceptual framework (Charmaz, 2006).

Constant comparison was used in conjunction with theoretical sampling to confirm how codes and categories related to previous data, without recoding, which is not required in constructivist grounded theory (Gibbs, 2013). For instance, when one participant claimed that some women in STEM employment were not interested in leadership positions, I followed that up by sampling the individual she had referred to. While the theoretical sample contradicted the leading participant, the initial code reflecting a conscious decision was not recoded as constructivist grounded theory permits. Instead, a new code was created. Theoretical saturation was achieved as further data collection stopped revealing any new concepts, prompting the need to stop further data collection (Lewis et al., 2016). As constructivist grounded theory allows for the conducting of the literature review before data collection, theoretical sensitivity was used to prevent existing theoretical concepts from influencing the interpretation of data from participants (Charmaz, 2006; Alemu et al., 2015).

4.8.4 Theoretical sensitivity

Theoretical sensitivity is one of the key concepts applied in all three types of grounded theory, though differently. They all define theoretical sensitivity as the ability of the researcher to develop concepts based on theory and not on the researcher's prior knowledge or the literature (Charmaz, 2006; Alemu et al., 2015). However, the three versions disagree on when the literature review should be conducted, as well as its effect on theoretical development. Glaser argues that the literature review in grounded theory should only be conducted after data analysis to avoid it contaminating the data and the theoretical sensitivity in the process (Glaser, 1978). Strauss, however, argues that the researcher's prior knowledge boosts data analysis and helps create theoretical sensitivity (Sebastian, 2019). Constructivist grounded theory considers the researcher to be the co-constructor of the theoretical framework (Charmaz, 2006; Sebastian, 2019). As such, it supports my prior knowledge as an important and unavoidable component of the process (Charmaz & Gibbs, 2015; Sebastian, 2019). Glaser (1978) does, however, concur with the

constructivist grounded theory assertion that the researcher's immersion in the literature review increases theoretical sensitivity.

Since this was an academic study, conducting a literature review before fieldwork was a requirement. Over and above that, being a STEM graduate and a former STEM sector worker, I did have prior knowledge and experiences somewhat similar to those of the participants. That helped in my understanding of the data, as well as its analysis. I was, however, conscious of the potential of my prior knowledge and the literature review to influence the direction of my data analysis. I therefore used member checking and other strategies of rigor (discussed later) to keep her personal biases in check.

4.8.5 Memo writing

Memo writing or memoing is an important component of constructivist grounded theory (Charmaz, 1996; Gibbs, 2013). As I coded the data, I analysed it further and deeper for in-depth understanding of what the data is communicating, as well as what is missing from it (Charmaz & Gibbs, 2015; Cronin, 2017). I employed memo writing throughout the data analysis process, comparing, and analysing codes and categories. Charmaz (1996) proposes having basic questions that will support the memo writing, which she defines as personal and private conversations.

4.8.6 Theoretical saturation

As data continued to be analysed using constant comparison and following theoretical sampling, eventually all new data became redundant as they stopped revealing any new categories to the research (Alemu et al., 2015; Flick, 2018; Foley et al., 2021). It was at this point that the study had reached theoretical saturation (Charmaz, 1996; Gheondea-Eladi, 2014; Alemu et al., 2015; Gentles et al., 2015). No further sampling of participants was required and the sample size could be verified (Charmaz, 1996; Alemu et al., 2015). There is a possibility of false claims of theoretical saturation where data analysis reveals a repetition of data without necessarily saturating the identified themes and categories (Charmaz, 2006; Gentles et al., 2015; Foley et al., 2021). I therefore constantly referred to the research questions to refine the emerging categories and ensure that all the relevant themes had been identified and theoretically saturated.

4.8.7 Criteria to ensure rigor

Constructivist grounded theory relies on the richness of data resulting from participants' willingness to share their personal experiences (Rolfe, 2006; Alemu et al., 2015). Rich data were

collected through rapport building with the participants to gain their trust (Charmaz, 2006; Marshall & Rossman, 2016). That contributed to the credibility of the research, as it rested on openness and full participation of the research participants (Alemu et al., 2015). While trustworthiness of a study depends on the perception of the reader (Rolfe, 2006), its credibility depends on the quality of the data (Charmaz, 2006).

While reliability and validity are often refuted in qualitative research, it is important to ensure quality and value of qualitative research findings through rigor (Krefting, 1991; Seale, 1997). As a STEM female graduate and former STEM professional who left the sector for an unrelated employment sector, I most likely had both conscious and unconscious biases concerning the topic. I therefore counted on the use of the constructivist grounded theory to manage potential bias and ensured rigor through its inductive-deductive or abductive nature (Leech & Onwuegbuzie, 2007; Alemu et al., 2015). Bracketing, reflexivity, constant comparison, peer debriefing through one-on-one and group supervision meetings, as well as member checking, were used to ensure credibility, transferability, dependability, and trustworthiness of the study (Creswell, 2008; Lewis, 2016). Guba's model of rigor, which refers to credibility (truth value), transferability (applicability), dependability (consistency) and confirmability (neutrality) as criteria that ensure rigor in qualitative research findings (Guba & Lincoln, 1986; Krefting, 1991), was used.

Credibility or truth value was achieved through reflexivity, member checking and peer debriefing (Guba & Lincoln, 1986; Krefting, 1991; Morse, 2015). Constant comparison of data sets from different contexts and sites was used to detect and eliminate biases and distortions in the analyses (Gasson, 2003; Rolfe, 2006; Marshall & Rossman, 2016). Constant comparison was also used to identify similarities among data sets, adding to the transferability (Gasson, 2003).

Transferability or applicability of findings was realised through the collection of rich thick data which were relatable to others in similar contexts (Guba & Lincoln, 1986; Gasson, 2003).

Dependability or consistency was achieved through peer debriefing, coding and the theoretical sampling procedure (Guba & Lincoln, 1986; Krefting, 1991; Morse, 2015).

Confirmability or neutrality was achieved through reflexivity (Guba & Lincoln, 1986; Gasson, 2003; Morse, 2015).

4.8.8 Bracketing

Bracketing in research is when researchers tune out their biases, preconceptions and any other knowledge they may have had prior to data collection (Given, 2008; Tufford & Newman, 2012). As the name implies, the researcher's prior knowledge is kept outside the brackets that contain the data being observed or collected regarding the phenomenon being studied. In order to achieve this, I used memoing to identify my prior knowledge, assumptions, biases and experiences that were related to the phenomenon and kept them from influencing the data analysis process (Given, 2008; Banerjee & Ghosh, 2018). Bracketing was consciously used during the interview process and early on in the data analysis stage (Given, 2008). As constructivist grounded theory expects the researcher to be a co-constructor of knowledge in the research, bracketed information was later incorporated into the bigger picture through further data analysis (Given, 2008). Keeping a research journal where my thoughts and feelings were documented, not only about the data but also about the research experience, assisted the bracketing process. Peer debriefing also helped as my supervisor and DBL peers were able to share their unbiased feedback during supervision meetings.

4.8.9 Reflexivity

Reflexivity calls for researcher responsibility in data collection and interpretation, as well as reflection on personal experiences and power in the research process (Flick, 2014; Cronin, 2017). As a STEM graduate and former STEM worker, I was challenged to reflect on my personal experiences and how they influenced my decision to exit the STEM employment sector. Reflexivity helped guard against personal biases which had the potential to influence the research process and subsequently the research findings, as a co-constructor of the theoretical framework (Given, 2008; Alemu et al., 2015). When one of the participants shared how her early life experiences of discrimination had shaped her personality so that she always took every assignment too seriously, I immediately saw myself in that statement. For a moment I felt a sudden rush of emotions and sadness.

I journaled my observations and thoughts from the interviews and reflected on my interpretation of the non-verbal communication. I constantly used reflexivity on my thoughts and feelings to manage the power I had as a researcher, in order to use it ethically (Lewis, Saunders & Thornhill, 2015). Self-reflexivity was further enhanced by peer debriefing, discussed later.

4.8.10 Data triangulation

Data collection was supposed to be done using different tools to ensure trustworthiness through triangulation (Creswell & Creswell, 2018). One-on-one interviews and focus group discussions were to be conducted to provide the opportunity to ensure rigor by checking the integrity of inferences made. Guba and Lincoln (1986) advocate data triangulation as a strategy to ensure credibility of the study. Leech and Onwuegbuzie (2007) concur on the importance of using different data sources in qualitative studies to ensure rigor. However, Flick (2014) argues that data triangulation is not necessary in every study. Since constructivist grounded theory relies on thick rich data collected through a rigorous process (Charmaz, 2017; Cronin, 2017), triangulation is not essential (Leedy & Ormrod, 2014; Flick, 2018), hence the decision to not pursue focus group interviews.

4.8.11 Peer debriefing

Peer debriefing was used to increase the accuracy of the representation of the accounts given by the participants (Charleston et al., 2014; Morse, 2015). I had debriefing sessions with my supervisor and other members of my group during supervision meetings to discuss my thoughts, observations, and interpretations (Morse, 2015; Creswell & Creswell, 2018). Their impartial feedback helped eliminate biases and wrong assumptions, while ensuring trustworthiness and credibility of the data representation (Cooper, Brandon & Lindberg, 1997; Hail, Hurst & Camp, 2011; Morse, 2015).

4.8.12 Member checking

After having coded interview data into themes, member checking was used to ensure that the words of the participants were correctly interpreted and represented (Leech & Onwuegbuzie, 2007; Creswell & Creswell, 2018). That was achieved by sharing the interpretations of emerging themes with the participants for their confirmation to ensure rigor and trustworthiness of the study (Leech & Onwuegbuzie, 2007; Creswell & Creswell, 2018).

4.8.13 Ethical considerations

Ethical concerns arise from research design through data collection, data management and data reporting (Flick, 2014; Lewis et al., 2016). The study did not use members of any vulnerable groups, as stipulated in the UNISA Ethics Application and supported by Creswell (2009) and Flick (2014). Ethical issues were considered during data collection to protect research participants from undesirable exposure (Creswell, 2009; Creswell & Creswell, 2018). Research participants were

required to give written consent by signing an informed consent form which clearly stipulated the ethical expectations of both the researcher and the participants (Flick, 2014). Research participants were given a participant information sheet. The participant information sheet communicated the purpose of the study and reassured them of their confidentiality, as well as that of their collected information.

It is important to comply with stipulated ethics requirements (Creswell, 2009; Creswell & Poth, 2018). Ethical data analysis and reporting were observed by respecting research participants' privacy and confidentiality, as well as protecting their individuality. Pseudonyms are used in this thesis to ensure anonymity of the participants. Data collected during the research was safely kept away from unauthorised access by saving it in password-requiring storage. No participants were put in danger as a result of this research. Ethics clearance was sought from the UNISA Research Ethics Committee before collecting data to ensure full compliance with the university's requirements for ethical research. The Ethics Clearance Certificate is attached to the thesis. The study was conducted in a manner that upheld the requirements of the UNISA Ethics Policy. There was no deviation from the approved research proposal. The integrity of research was upheld by avoiding any behaviour that might be disgraceful to research science.

4.9 CONCLUSION

This chapter detailed the research methodology that was used in the study. The methodological choices were justified by illustrating the suitability of constructivist grounded theory qualitative research methods in studying women's lived experiences. Specific examples from the research process were used to substantiate methodological claims, demonstrating fit with interpretivism and intersectionality. The application of constructivist grounded theory process in the development of a theoretical framework for gender transformation in STEM leadership was explained. The criteria applied to ensure rigor in the study were described. The chapter concluded with a discussion of the ethical considerations that were applied to protect the participants and the reputations of UNISA and science. The next chapter presents and discusses the research findings.

CHAPTER 5: FINDINGS AND DISCUSSION

5.1 INTRODUCTION

This chapter presents key findings of the study, with discussions drawn from relevant literature. The findings are presented through five themes and eleven subthemes related to each research objective. The chapter introduces the participants through their profiles. Each theme and subtheme are further discussed under the findings and discussion section of the chapter, under its relevant research objective. Although the study had five research objectives, objectives 4 and 5 are not included in the themes and sub-themes table. They are presented as strategies and conceptual framework, respectively, at the end of this chapter. Table 5.1 below presents themes and subthemes under each research objective.

Table 5. 1: Themes and sub-themes

Research objectives	Themes and subthemes
1. Investigate the effects of the intersection of age, culture, and gender in the working lives of women in the Botswana STEM leadership.	**Theme 1: Collusion of national culture and STEM industry culture creates negative experiences for women** *Sub-theme 1.1: There is a thin line between national culture and STEM industry culture* *Sub-theme 1.2: Even if you are a woman leader at work, you cannot disregard culture* *Sub-theme 1.3: When men are leaders and women play second fiddle* **Theme 2: Gender discrimination and its psycho-social fallouts** *Sub-theme 2.1: I cried every day!* **Theme 3: Expectations in women's cultural lives clash with their professional lives** *Sub-theme 3.1: Women's complicity*
2. Examine how STEM industry culture systematically impacts women in Botswana STEM leadership.	**Theme 4: Constantly having to prove yourself beyond (un)reasonable doubt** *Sub-theme 4.1: Women in STEM: Outsiders within* *Sub-theme 4.2: When what is good enough for the goose is not good enough for the gander* **Theme 5: Bullying and intimidation of women** *Sub-theme 5.1: Sexual harassment*
3. Explore the reasons for continued male dominance in the Botswana STEM leadership.	**Theme 6: The gendered manifestation of STEM leadership** *Sub-theme 6.1: The inclusion of women in STEM is just a song* *Sub-theme 6.2: When women in STEM adopt masculinity* *Sub-theme 6.3: STEM women's denialism and performative identities*

Objective 1 has three themes and five sub-themes. Objective 2 has two themes and three sub-themes, while objective 3 has one theme and three sub-themes. The themes and sub-themes are discussed in more detail in this chapter.

5.2 PARTICIPANT PROFILES

The participants' ages ranged between 33 and 63 years. Sixteen of the participants were still employed in the STEM sector, fifteen of whom held leadership positions ranging from middle management (9) to top management (6). One participant over the age of 40 had never held a leadership position. Four of the participants were not working in the STEM sector for an array of reasons.

Of the four participants in non-STEM jobs, one had failed to secure a job in the sector after graduating and she settled for the next available alternative opportunity. The second participant worked in STEM for six years but always doubted her future in STEM. She feared that the work culture in the industry would not support her life plans of marriage and motherhood. The third participant ended up losing interest due to her work-life conflict. The fourth participant took a break from work to further her studies, with the hope of returning to the sector. Unfortunately, that proved to be difficult, and she was unsuccessful in getting a job aligned with her STEM qualification, experience, and additional qualifications.

The participants' profiles are presented in Table 5.2 below. Pseudonyms are used to protect participants' identities.

Table 5. 2: Participant Profiles

PARTICIPANT	SUBFIELD/DOMAIN	AGE	CURRENT ROLE	Leadership level	QUALIFICATIONS
STEM leaders over the age of 40					
1. Mmabatho	Civil Engineering	60-70	Retired (Consulting Engineer – Chief Executive Officer)	Top Management	BEng. (Civil)
2. Dinotshi	Design and Technology	50-60	Academics Director	Top Management	BEd. (Design and Technology) MSc. (Educational Technology)
3. Kelly	Civil Engineering	50-60	Consulting Engineering Company owner – Chief Executive Officer	Top Management	Diploma in Water Engineering BEng. (Civil) Master's in Project Management
4. Ouna	Electrical Engineering	40-50	Consulting Engineering Company owner – Chief Executive Officer	Top Management	BEng. (Electrical) MBA
5. Kuda	Telecommunications Engineering	40-50	Director	Top Management	BSc. (Computer Science)
6. Neo	ICT	40-50	ICT Consulting Company owner – Chief Executive Officer	Top Management	BSc. Computer Science
7. Nchidzi	Chemical Engineering +Mining Engineering	40-50	Snr Manager, Projects – Mining	Senior Management	BEng. (Chemical) MEng. (Mining)
8. Pinky	Quantity Surveying	40-50	Chief Executive Officer	Top Management	BSc. (Quantity Surveying)
9. Tebogo	Electrical Engineering	40-50	Manager – Power Generation	Middle Management	BEng. (Electrical)
10 Masego	Civil Engineering	40-50	Snr Manager – Engineering	Senior Management	BEng. (Civil) Master's (Construction Law)
STEM leaders under the age of 40					
11. Boleng	Building Technology	30-40	Construction Site Engineer	Middle Management	BEng. (Building Technology)
12. Ludo	Chemical Engineering	30-40	Manager, Projects – Power Generation	Middle Management	BEng. (Chemical)
13. Tumelo	Industrial Engineering	30-40	Senior Manager – Engineering	Senior Management	BEng. (Industrial)
14. Tapiwa	Civil Engineering	30-40	Construction Site Engineer	Middle Management	BEng. (Civil)
15. Kate	Quantity Surveying	30-40	Chief Engineer	Senior Management	BSc. (Quantity Surveying)
STEM graduate who never applied for a leadership position					
16. Bonolo	Chemistry major	40-50	Researcher	Never held a leadership position	PhD (Chemistry)
STEM graduates who left the field					
17. Boitumelo	Electrical Engineering	50-60	Left after 25 years	Middle Management	Diploma (Electrical) HND (Electrical) BEng. (Electrical)
18. Dolly	Mechanical Engineering	40-50	Never joined	Top Management	BEng. (Mechanical) MSc. (Strategy Management)
19. Lorato	Chemistry major	40-50	Left after 7 years	Top Management	BSc. (Chemistry) MSc. (Strategy Management)
20. Magdalene	Telecommunications Engineering	40-50	Left after 6 years	Unemployed	BEng. (Telecommunications) MEng. (Project Management)

Six out of the ten participants in STEM leadership over the age of forty held master's degrees while the other four held bachelor's degrees. The five participants in STEM leadership under the age of forty all held bachelor's degrees as their highest qualification. Three out of the four participants not in STEM employment held master's degrees. The participant with no leadership experience held a doctoral degree. Age wise, only one of the participants in STEM leadership over the age of 40 was in middle management, while nine were in senior and top management. Three of them worked in their own companies. Of the five under the age of forty in STEM leadership positions, only one held a senior leadership position while four were in middle management.

5.3 FINDINGS AND DISCUSSION

The purpose of this study was to investigate women leaders' experiences at the intersection of their age, gender, and national culture on one hand and industry culture on the other. The overall findings of the study show that the broader socio-cultural context and the STEM industry culture had the strongest impact on the women leaders' experiences of marginalisation. Ageism was more pronounced amongst younger women (under 40 years old) and older women (above 45 years old, including those under the age of 50), and less so for middle-aged women leaders (under 45 years old). While youth was associated with inexperience for both men and women, young women's age tended to be viewed more negatively. This had serious career-limiting implications for the women. Similarly, while older age was cherished for men and considered a sign of wisdom, it was shunned as a sign of decline for women.

What separates these two groups, however, is the attention that the older group's ageism gets in research, as opposed to that of the young. Although the influence of gender on younger women's experiences of ageism is often noted and acknowledged, the data are inadequately followed in research. This dynamic was noted as part of the knowledge gap at the beginning of the research, and it influenced the inclusion of age as a social identity in this study. Middle-aged women, on the other hand, were somewhat shielded by the illusion of equality as progression seemed relatively accessible, up to middle management. Overall, gender remained the constant reason for women's marginalisation, negatively intersecting with all their subordinate social identities.

Although all the participants recalled negative genderization experiences during their early years in STEM employment, some of them tolerated it, thinking that the experiences were due to age and had nothing to do with gender. The expectation was that as one climbed up the leadership ladder, one's position in the "food chain" would improve. This proved not to be the case. A common thread in the women's experiences was the disregard for their academic achievements and demonstrated expertise. Ultimately, women's gender, and the national culture entangled with the industry culture, played a big role in creating barriers to progression beyond certain levels of leadership. This is perpetuating male dominance in STEM leadership in Botswana. These overall findings are unpacked next.

The following discussion is structured as follows. The research findings are presented in a storyline told according to themes and sub-themes emerging from data analysis. The verbatim quotes from the interviews are then presented under each theme and sub-theme to narrate the participants' stories in their own words. Each theme is introduced with a summary to introduce the storyline. The findings presentation captures the storyline from the intersectionality lens which is the key conceptual framework of the study. This chapter discusses literature related to the study considering the findings, both previously known and emerging knowledge. The literature is included in the discussion at the end of each sub-theme.

5.4 Research objective 1

Investigate the effects of the intersection of age, culture, and gender in the working lives of women in the Botswana STEM leadership.

Theme 1: Collusion between national culture and STEM industry culture creates negative experiences for women

The purpose of this study was to explore how the intersection of gender, national culture and age impacted women leaders' experiences in the STEM sector in Botswana. Industry sector dynamics were the focus of objectives 2 and 3. It emerged from the data, however, that the broader Botswana socio-cultural context, which is patriarchal, together with the STEM industry culture, which is predominantly masculine, had the strongest impact on women's leadership experiences. This theme demonstrates how the national culture follows women around and unfairly empowers men over women, irrespective of the woman's relational position.

Sub-theme 1.1: There is a thin line between national culture and STEM industry culture

Together, national culture and STEM industry culture created negative lived experiences for women across generations as both kept showing up at the heart of the participants' leadership experiences. Patriarchal national culture pervades the STEM culture, intimidating women to doubt their capabilities. Women's experiences in STEM leadership often paint a chilling picture of the industry's perception of women leaders as inadequate. As the narrative around women's capability plays out repeatedly in their lives, challenged and doubted to breaking point, eventually they start believing it. Women have to constantly contend with self-talk which is not always positive, sometimes resulting in self-limiting thoughts and behaviour.

Even if you are a woman leader at work you cannot disregard culture

There is a saying in the SeTswana culture, that *monna ke tlhogo ya lelapa*. This speaks to the idea that, according to culture, the man is the head of the family and the only decision maker in the home. The wife, on the other hand, is considered to be the husband's first-born child. This shapes all social and professional interactions in a gendered hierarchical way, irrespective of a woman's positional power at work. It is within this societal context, therefore, that leadership is viewed as a man's prerogative in Botswana.

The following participant argued for men's rights to be territorial because that was what culture dictated and why women should negotiate acceptance as leaders. This was one of the strongest women in Botswana STEM leadership and to hear her yielding to cultural pressures in this way was quite telling:

> *As you know our culture will always be there. Basically, for men to recognise you, you also need to conduct yourself in a certain way, and I believe I learned to do that. As you know, traditionally, men are the ones who always come up with good decisions, you know, for our mothers. And what I have observed as a woman, which is also culturally correct, I think you will agree with me, when you are talking to a man, you need to show respect…because they like to feel that they are respected. So you do not just approach them recklessly. You need to find a way that you can work together, that they can accommodate you in their thinking. How? By just saying, you know, I have this idea. I do not know what you think about it. Yeah, so it also happens even now in marriage, if you are married, or if you are in a relationship, it is still there. Because it is culture. So even if you are a woman in STEM, let us not disregard culture. Because we will be lying to ourselves.*

Kelly

Indeed, some participants argued that there was a thin line between national culture and industry culture in Botswana:

> *There is nothing called the STEM culture. There is a culture and our culture dictates that a man has to be dominating the females that are around him. Our culture as Africans or Tswana says that a woman's place is in the home and when we are talking about home, we are not talking about them repairing radios. We are talking about them cooking and making babies. The other side of this culture says a man is the one who knows everything. This guy from the farm, we have a problem because I can never tell him anything for him to do anything. Even if I do and he says yes, he doesn't do it until my husband repeats it because he believes culture says a woman has no place in giving instructions to a man.*
>
> *Dolly*

Culture has been singled out as the greatest creator of barriers to women's progression due to, among others, the ingrained culture that associates leadership with masculinity (Carlson, Kacmar, Zivnuska & Ferguson, 2015; Arredondo et al., 2022). The STEM sector is not immune to this (McCullough, 2020; Arredondo et al., 2022; Herrera et al., 2022). While women may have relational power as partners in marriage, the man is the ultimate leader and decision maker in the Tswana culture, more so in profit-related decisions (Petitt, 2016; Horvoka, Alice & Must, 2019). Just as leaders are influenced by their past cultural experiences, so are their followers (Kim, 2019).

The following participant, a younger woman leader, shared Kelly's sentiments about the man's natural leadership role. This patriarchal mindset that puts men on pedestals often translates into women's inferiority complex, and complicity at times:

> *We want them to be over-protective. So, I think even on site, you know, I've always expected, for instance, if I'm working with the clerk on site, I expect him as a male figure to protect me from all these harsh environments on site. I don't know, why. I think in terms of culture it's the way w e are raised. As a female there is a way we view men … how we see the male counterparts. It happens naturally, to give them that respect and not speak over them. You have to act in a certain way when you're with them. Even when at times it has disadvantaged me when I have a good idea,*

and I really want to share it, I don't want to be the first one to say it. Instead, I wait to hear if the gentleman with me will say the idea before I can contribute.

Boleng

However, not everyone agrees:

I remember one time during a weekly catch up meeting where we were to catch up on a project, and we disagreed on a particular project where he wanted to overrule a certain decision and it just didn't make sense, and we were at loggerheads, and I wasn't backing down, and he was like, "you know even at home when you argue with your wife she has to back down," bringing the context of a wife to a work discussion. I could not understand what he was trying to communicate. That I am inferior to him because I am a woman, and I must therefore stop arguing with him because I am a woman?

Neo

Some of the sentiments expressed by the participants underscored the interconnectedness of STEM leadership and family dynamics, affirming Bandura's social cognitive theory experiment (Bandura, Ross & Ross, 1963; Diekman et al., 2017). As in Bandura's experiment, the women's learned behaviour, including gender stereotypes, can be attributed to the environment they were socialised in from an early age. The participants had deeply entrenched viewpoints about the structural power that men wielded over women, to which some of them responded positively (Morgenroth, Ryan & Peters, 2015; Horvoka, Alice & Must, 2019; Kim & Toh, 2019).

Tebogo problematised the role that the cultural upbringing of children played in women's formative years. According to Tebogo, girls were often given names like "Segametsi", implying that they would grow up to be brides serving their husbands and inlaws, while boys would be named "kgosi", meaning chief, already designating them as leaders at birth (Ceci et al., 2014; Kahn & Ginther, 2017).

Even as leaders, women are expected to "know their place", so to speak (Moswete & Lacey, 2015; Pringle et al., 2017; Kim & Toh, 2019). The patriarchal national culture determines the respect and influence women and men command in society (Moswete & Lacey, 2015; Kim & Toh, 2019) and that is imported into the workplace. Both Kelly and Boleng's statements affirm

the assertion by Moss-Racusin et al. (2018) that women believe that they do not belong in STEM due to the gender bias. Their belief in the concept of the "father as provider" (Helman, Kaminer & Malherbe, 2018) demonstrates that the gender bias is perpetrated not only by men, but also by women. Moswete and Lacey (2015) put the Botswana national culture into perspective – that it is not only about STEM leadership, but about leadership as a man's place in general.

Neo, however, expressed different sentiments, resisting the disempowering intrusion of national culture into the STEM workplace. When her supervisor tried to play the "man is the head of the family" card, she refused to back down, demanding for her leadership and intellect to be respected. Her view was that they were work colleagues in a professional setting, meaning social culture had no place in the discussion. In the final analysis, culture, be it national or STEM culture, guides the way individuals perceive themselves and others around them, as well as the resultant systemic power structures culture creates (Diekman et al., 2017; Kim & Toh, 2019).

Boleng and Kelly's viewpoints proved to be unsustainable. They also, at times, fought back when societal culture worked against them in the work environment:

> *I remember of a challenge I had three years ago with a facilities management team. Imagine one woman, seven men, we had a meeting that started at two o'clock, and it ended at 12 midnight, and in my heart, I was worried, but I had to be strong, I made my point very clearly. I was the project manager. We were in a project together, so they did not want to comply, but when it came to payments, they wanted a bigger share. So, I had to now show them how we got to that stage, until they just gave up. So that was a turning point in my life. I realized that I was a strong person. 7 hours! 5 men.*
>
> *Kelly*

There were no intragroup similarities on this matter, as the inter-generational divide on the issue was lacking. Neo and Dolly in their mid and late forties were the only ones whose thoughts were aligned with the narrative, making it impossible to homogenise STEM women's intersectionality, even though the temptation often lingered. Tebogo, on the other hand, blamed culture for the women's marginalisation, while she embraced it in her workplace interactions and carried herself "accordingly."

"Ga di etelelwe pele ke manamagadi!" It is an abomination!

The former president of Malawi, Mrs Joyce Banda, shared her experiences as a woman in waiting to assume the highest leadership position in her country. Her opponents would not miss the opportunity to use the national adage that it was the bull that pulled heavy loads, while the cow remained at home to provide milk, representing the women's subordination (Gillard & Okwonkwo-Iweala, 2020). The adage is commonly used to proclaim women's unsuitability to lead.

Just like Joyce Banda, the following participant was told that women's leadership was un-cultural, to her face. She was also called "ngwananyana", to emphasise her youth and to imply immaturity. This was a deliberate attempt by her male subordinates to demonstrate how inappropriate they considered her appointment to be. This made it easier for them to give her crude feedback, because to them, culturally, she did not deserve their respect:

> *So, I addressed the meeting, and you know those we call industrial class and technicians, they are hard to manage and supervise but they are very honest, because they point blank told me "Ga di etelelwe pele ke manamagadi!" (cows never lead bulls). This is an abomination! They had never seen it! They wondered why they were being tried…I had asked for meetings around to meet and greet them. I am being introduced as the new Chief. They had been used to the previous one who was an unqualified for the position.*
>
> *Kate*

Interestingly, the age of a male colleague who was of a similar age and was promoted at the same time as she was, was never made an issue. It was as if as a man, it was his birth-right to lead.

The next participant was older, in her forties. But just as with Kate, her age was used against her, from *"ngwananyana"* (young girl) to *"mosadimogolo"* (old woman):

> *I think the connection basically is the part that "ga di nke di etellwa ke manamagadi pele." I don't think if I was a man, I would experience the same level of disrespect I see from some of my colleagues. So that basically is the issue that men are still stereotyped that they are expected to be leaders at all times…So in my view, if we were not Batswana, I would invite someone to sit at the table and say can we talk about this. But in some cases, you can see that the issue is that you are a woman*

and there is nothing I can discuss with you. For someone to call you "mosadi ke wena" (you woman)," mosadimogolo" (old woman), and it turns out he is one full year older than me…The old woman statement is just a derogatory statement to break you and make you feel like you have lost value and can't contribute much.

Masego

Evidently, it depends on one's gender, as the following participant in her mid-fifties felt as if she was being discriminated against by virtue of being "too old" by her younger male subordinates in their thirties:

It is like "they are tired and must make way for us". Our culture is dictating that. We are judged differently.

Dinotshi

Society believes in the patriarchal cultural adage that women do not have a place in masculine jobs (Dutta, 2018; Gillard & Okwonkwo-Iweala, 2020). According to Dutta (2018), women are culturally excluded from STEM leadership opportunities, the same way the participants were. The masculine nature of STEM treats women as outsiders (Jackson, Hillard & Schneider, 2014; Cohen, Duberley & Fernando, 2019).

Abrams, Christopher and Swift concur that ageism affects the very young and the very old more than the middle aged, those "closer to birth and death" (2020: 8). I would rather call them the near birth and near retirement, as leaving employment does not necessarily imply death. Although Kate's treatment seemed to affirm the Tswana cultural association of youth with being wet behind the ears, the association of old age with wisdom does not seem to be universally applied (Diehl, 2017).

A CNN anchor, Don Lemon, recently commented on live television that Nikki Haley, a fifty-one-year-old primary presidential candidate, was not in her prime because women were only in their prime between their twenties and forties (Brisco, 2023). To try to compare a fifty-one-year-old woman to seventy-six-year-old former President Trump, and eighty-year-old President Biden, exemplifies the unconscious bias women contend with in their daily lives. In the final analysis, it is just an excuse to discredit women leaders. This generally demonstrates the problematic nature of age in both younger women's and older women's professional lives. This also reflects the overall societal culture which discriminates against women, irrespective

of age (Hunt, 2015; Gillard & Okwonkwo-Iweala, 2020). The common African adage to intimidate women away from leadership positions is evidently common not only in Botswana but across the African Continent (Moswete & Lacey, 2015; Gillard & Okwonkwo-Iweala, 2020; Okpokwasili & Dukop, 2023).

Sub-theme 1.2: When men are leaders and women play second fiddle

Women in STEM leadership constantly have their backs against the wall as they have to push against the men emboldened by the masculine nature of the STEM environment that puts men on pedestals as prototypical leaders. The women's lives are made miserable by men deriding their contributions and capabilities in an attempt to prove why leadership is a man's prerogative. The following participant shared her experiences of rejection as a leader because the patriarchal societal culture found its way into her employer organisation and intertwined with the masculine STEM culture:

> *We cannot shy away from the cultural patriarchal system and the influence it has on the organisation. It has definitely influenced the relations in the workplace, that the man is the head, and the woman is inferior. And when a woman is leading there will always be that subtle disrespect. I have experienced it so many times where obviously as the only woman in the industry, being part of management, I would have subordinates or relate with my male colleagues. So definitely the cultural dynamics played a huge role in my experience…I think it goes to the same thing where competence is questioned, where I am trying to speak and a man speaks over me, or tries to jump in and say "what Neo is trying to say is..." My male colleagues were listened to. If I say a point and they repeat it then it would be welcomed as if it is a new great point, some even nodding to show that it is a great point. And the level of respect! My male counterparts were respected much more than I was.*
>
> *Neo*

While some subordinates might verbalise their disrespect, others act it out through passive aggression. The message, however, remains the same:

> *You see, sometimes you would go to meetings with some men, where a meeting is chaired by other men and then you will see the difference. And then you realise that ok, so when I am the one chairing a meeting, this is what they do, and if it is a man chairing this is what they do. You can see the difference that you are being disrespected… You'll say something and they pretend it is not much…and then they*

take your point and run with it when you are the one who said it first. We have to work three times harder than the men. You must put in three times the effort. Otherwise, they don't see you.

Nchidzi

The following participant's appointment was questioned by a subordinate who was unqualified and had not even bothered to apply for the position. Appointing a woman was, to him, unacceptable, as if being a man was a qualification and was more important than academic qualifications and experience:

After one of my promotions, one of the guys that I supervise queried that I found him at the organisation and progressed ahead of him. Possibly that could be the reason they are questioning my authority. He did not qualify because he only had a diploma.

Masego

When I probed her experiences as a more mature leader compared to when she was younger, it was clear that the pattern of disrespect and "othering" was consistent:

It was still the same (speaks louder)! Generally, men are wired to be at the top of the food chain and that is the mentality they adopt. I remember one incident where we attended a meeting, and I was chairing. My male subordinate was upset that I had corrected the minutes and said I should have just written them myself. He could not take it. And he was a young male Engineer. Sandra, these are small issues that are straight forward, but because it is you, they become complicated. So, the following meeting he refused to take the minutes, so I decided to be the bigger person because it was just the two of us with an external client.

Masego

These participants faced hostility from male subordinates simply because they were women in "men's" roles (Hyman, Wilkins-Yel & Zounlome, 2019; Kim & Meister, 2022). While men are afforded respect automatically, women have to earn it. Both women and men come from a culture that puts men on pedestals as providers while indifferent to women's cultural role of homemaker (Helman, Kaminer & Malherbe, 2018; Mukhwana, Abuya, Matanda, Omumbo & Mabuka,, 2020) and sometimes even unappreciative (Gray, O'Connor & O'Hagan, 2018). The

men, therefore, easily benefit from the continuation of the societal culture's influence on the STEM culture, while systematically disadvantaging women.

The women are constantly under pressure to keep their heads above STEM waters of (in)visibility and unfair gendered comparisons (Hatmaker, 2013; Briggs, Gardner & Ryan, 2023). As evident in the data above, appreciating a contribution is often less about what is said and more about who said it. The participants were not heard because they were non-prototypical leaders (Barthelemy, McCormick & Henderson, 2016; van Esch, Assylkhan, & Bilimoria 2017). They had to prove their worth (Lewis et al., 2013; Moss-Racusin et al., 2018).

Men across all levels struggled to hear or see women because they did not fit the cultural definition of a STEM leader that the men could socially identify with (Barreto & Hogg, 2017; Steffens, Peters, Haslam & Platow, 2018). The participants' experiences demonstrate men's unconscious bias and microaggressions against women's capability, both physically and intellectually, often as a strategy to intimidate women. Interestingly, the "manterruptions" and "mansplainings" are commonplace in leadership spaces where men are the majority (O'Connell & McKinnon, 2021; Herrera et al., 2022). According to Jacobi and Schweers, women get interrupted three times more than men because "to be a woman is to be interrupted" (Jacobi & Schweers, 2017: 1381), no matter your professional accomplishments. Judge Sotomayor from the Supreme Court of America said that her tactic to handle that was to "interrupt back" (De Vogue, 2021). Unfortunately, talking back to elders in the Setswana culture is taboo, even more so if you are a woman. It is considered uncultured and impolite, which explains the capitulation by Kelly and Boleng, despite being strong gender equality advocates.

Unrelenting gender role stereotypes

Another salient manifestation – still very much alive – of the convergence of the societal and industry cultures was through gender role stereotyping as the "STEM tea-ladies and secretaries". That "pin drop moment", as Neo put it, portrays the shock and disbelief these men experience when a woman refuses to perform gender affirming tasks, because pouring tea for her supervisor is an unwritten key performance indicator:

> *One even had the audacity to ask me to, and I said No, you can do it yourself. And he was my boss. I made it clear that I was not the tea lady. You can pour your own*

tea. They would beg me, and I would say "why don't you ask one of the gentlemen in the room? Why are you asking me?" And there would be a pin drop moment.

Neo

The following participant shared her own gender role stereotyping moment which was bitterly wrestled with her supervisor. Rules were changed to accommodate cultural expectations that reinforced the gender role stereotype narrative that positioned women as nothing more than unappreciated help:

I was told, "Madam, here the last person who joins the Team becomes the minutes taker up until a new person comes". I said fair enough. So, I became the minute taker as the latest team member…I happened to be the only lady. Then a year or a couple of years later a gentleman joined. And then the day arrived for us to hold a meeting. When the meeting started someone said, "who is taking the minutes?" And I kept quiet. And then this guy, who was my supervisor says "of course Mmabatho is taking the minutes! … you are going to take the minutes. You are a woman … women are people who take minutes." I said, "unfortunately I only studied Engineering. I did not study how to take minutes, so I am just like the rest of you." Let us implement the resolution which was imposed on me when I arrived. My boss tried to insist, but then I said no. So, I think that is what started the friction between us.

Mmabatho

In contrast, the following participant decided to let the stereotyping slide and treated it as a simple misunderstanding. Her lack of emotion towards the genderisation points to ambiguity between condonation and self-preservation:

The architect starts, "so who's secretary are you?" there, were two other guys who were junior architects and then you had engineers there, we had the civil engineer there, the structural engineer, mechanical engineer, electrical engineer. They were all men, so I was the only woman there, so he just assumed that I am there as a secretary to somebody in the meeting, and I was like, "no I am the quantity surveyor on the project", and he was like "what?" And also, I was young. You see what I mean? I was like yeah, but I did not take offense.

Pinky

The participants' experiences demonstrate the way culture exposes STEM women to discrimination due to stereotypes that challenge their sense of belonging ((Barthelemy, McCormick & Henderson, 2016; van Esch, Assylkhan, & Bilimoria, 2017; Master & Meltzoff, 2020). Their "othering" ultimately results in their disempowerment as leaders (Climer, 2016; Cohen, Duberley & Fernando, 2019), relegating them to gender stereotyped roles, some of which are completely unrelated to their jobs. The women's voices are drowned, ignored, or trivialised. The *STEM secretaries and tea-ladies continue to define women's presence in STEM.* While Neo and Mmabatho forcefully pushed back, Pinky capitulated and rolled with the punches. However, when it came to her woman friend's ordeal where she was made to count plumbing, a job which she thought should be done by a semi-skilled employee, Pinky's response was more aggressive:

> *I know some lady she is a quantity surveyor, she was working in the office, obviously full of men and then she felt they were challenging her when they were doing one of the big projects at <name of organization>. One time she was told to go and measure plumbing. Do you know how tedious plumbing is? No quantity surveyor wants to measure plumbing. When I was working as a consultant, we had an artisan who was responsible for measuring plumbing, I would not go to measure plumbing, no matter how much you pay me.*
>
> *Pinky*

This, again, shows that there is no linear narrative as to how women are affected at any given time, and when or how they will be triggered.

Theme 2: Gender discrimination and its psycho-social fallouts

The STEM environment seems to be shocking and devastating for women, and not just at a younger age. Some of the participants met the negative experiences later in life. What seemed to be consistent though was the fact that at entry point there was noted marginalisation, but not to breaking point levels. Masego referred to it as her "*time to submit*". All the destructive experiences which brought some participants to tears were at competitive levels of leadership, where women tend to be viewed as threats to the male dominance in STEM leadership.

Sub-theme 2.1: I cried every day!

The following participant shared a painful ordeal where she was doubted not only by her subordinates, but also by her supervisor:

And Sandra, that was a very difficult time in my career life. If I didn't have the tenacity I would be getting into my bedroom and crying every day! At that time, you need to have emotional intelligence to deal with the situation. A strong kind. Not showing that you are buckling in. But there was a time I felt like I was buckling in. The walls were coming crushing down on me.

Masego

Some of the participants were still relatively young when they got leadership opportunities, making it more difficult for them to comprehend the blatant rejection:

Oh my God! You see that one! It is a book in itself! ***I cried every day!*** *I think for a month. I told <name> that, 'girl! No place will ever break me if this place did not break me. Never!'*

Kate

The following participant did not cry herself, probably because she was more mature and experienced at the time and had developed a thick skin, but she worked with another woman who could not take the hostility:

When I started here, I started with one lady. ***She used to be crying all the time*** *and I used to also have a tough time, but I took it upon myself that I'm not going to allow these guys to treat me like that.*

Dolly

These participants cried as a sign of helplessness and those who did not cry, still acknowledged the pain (Johnson, Widnall & Benya, 2018), whether publicly or privately. They felt isolated as women in male-dominated work spaces (O'Connell & McKinnon, 2021).

Interestingly, some women seem to berate women who show emotions such as crying for being dramatic. A participant in the study of Bagilhole, Dainty and Powell (2008), a civil engineering student who did not like women because they were "annoying", admitted that she studied civil engineering because there were few women in engineering. This demonstrates the attitudes of women who embrace tokenism and choose to be queen bees. This behaviour unfortunately borders on sexism, albeit unintentional (Sterk, Meeussen & Van Laar, 2018). Queen bees choose to disassociate themselves from characteristics said to be typical of women, instead affirming the negative stereotypes. These are the women leaders who are less likely to benefit

other women as they view female characteristics as a sign of weakness. They tend to use the gender card only as far as it benefits them, but not the women below them (Sterk, Meeussen & Van Laar, 2018). Although some of the participants in this study occasionally disavowed some behaviours often associated with women, they did seem like genuine advocates of gender equality.

Intragroup dynamics: Self-othering

Women complained about the inequality they suffered in STEM employment as their skills were doubted and challenged. Some of the participants, however, revealed women's unconscious bias against other women, doing unto each other what they did not want to be done to themselves. The following participant was complaining about the subtle questioning of her capabilities as a quantity surveyor, yet she had the exact same dismissive reaction towards another STEM woman at face value:

> *I know the company is hers. She does the water proofing. Then she comes to site, maybe it is because she had an attitude. She comes to site and then, so I am waiting to see her getting up the roof and I did not say it to her. I just said it to myself," so she is there struggling with the step ladder." She was with another guy. So, then she is the one going up the roof. The guy is the one holding the ladder. Then I am like "does she really know what she is doing"? Then I was like if it was a guy I would not even be having these thoughts, you see what I mean so it also happens to us as well.*
>
> *Pinky*

The following participant gave the example of interviews she watched on TV for the position of chief justice in South Africa. One of the three candidates was a woman:

> *Yes! Yes! That is so true! It is a big problem…I had a discussion with my husband scrutinising the woman who was interviewed. There was a point where she really disappointed me in the way she answered a question, and he was like "you are being too hard on her," and I was like, "unfortunately that is the society we live in, you have to be spotless as a woman because all eyes are on you. You cannot afford a slipup. Because the minute you slip up then it will be pounced on like ehee!" You are not going to be easily forgiven, unlike if it was a man saying the same thing as you. So that is the standard we hold each other up to. It is unfortunate, but it is our reality.*
>
> *Neo*

Another participant witnessed other women defending additional requirements placed on a woman candidate to break an interview tie in a man's favour:

> *I saw the interview questions and they were just technical questions and nothing on physical capabilities. And then I tried to use myself as an example, that I have also worked in a field where I worked in such conditions and managed well. And someone's response was "those were the days." I could tell that they had made up their minds regarding women's capabilities and there was no amount of convincing that would make them change their mind. And mind you, it was women in the panel that were saying such statements.*
>
> *Dinotshi*

This participant acknowledged the queen bee problem plaguing women:

> *But then the other challenge I am seeing is that women end up working against each other…Women advocate for themselves as individuals under the guise of the collective. That's a discussion for another day! Women are the ones who fail these policies because we want to be the only ones who benefit as an individual. Like we do at polling stations. We vote for men, and when they get into power, they start developing policies that oppress us.*
>
> *Masego*

Women's technical knowledge is judged harshly, not only by men but also by women. Their shortcomings are magnified, while those of men are ignored. Women who work in male-dominated fields are under pressure to be perfect. While they complain about being subject to double standards, they tend to do the same to each other (Derks et al., 2017; Seron et al., 2018). All three participants above admitted that doubting these women was baseless. Queen bee tendencies espoused by some women perpetuate the exclusion of their own gender from STEM leadership positions (King, Leavell & Maniam, 2017). In the final analysis, the few women who make it to top leadership end up isolated and voiceless as tokens.

Relationship fallouts

Interestingly, it is evident that the men are socially intimidated by women they deem powerful in whatever way, despite their own personal power and success. Being in the masculine STEM

environment makes STEM women generally intimidating and sometimes considered too good by men.

The next participant suffered rejection because she was too good for a potential boyfriend:

> *Just after my divorce, a friend of mine said "you know I am having a party on this day, and I would like to introduce you to a friend of mine. You guys would be good together." "Ok go ahead. I will be in Gaborone on that day." When I was just about to come to Gaborone, she says, "my friend has chickened out because you have a PhD, so he is not comfortable with dating a woman with a PhD". The guy also was a doctor apparently, I don't know if he was a medical doctor or an academic.*
>
> *Bonolo*

The following participant shared her experiences with her ex-husband's struggles with her occupational power:

> *The moment he marries you, and then you have children, he will now forget about the profession. And now sees you only as a wife. And then he will expect you to be home, taking care of the children forgetting that you also have this professional obligation. And then he will be complaining and complaining. Because I remember I also had that challenge in my relationship, where my ex-husband felt that I spent a lot of time at work. Yes, so I am also a victim on that one. So, we had differences because of that.*
>
> *Kelly*

This participant shared an uncomfortable reflection of the negative impact the STEM industry culture had had on her personal life:

> *I watch football, I have to watch football and enjoy it, now really truly speaking I am like a man. Truly speaking and that is why maybe my relationships are not working out because I am too much of a man. My fiancée broke up with me, because he was complaining that I am too cold, I am…a man. You know, the worst he said was, 'it looks like I am going to be the woman in this marriage," because yea, I had to be male a bit to get to a certain level.*
>
> *Kate*

If men cannot handle women with personal power in social circles, that clearly explains why they would use all their might to "manage" women out of leadership positions in their presumed occupational territory (Carlson, Kacmar, Zivnuska & Ferguson, 2015). During the interview Kelly emphasised the importance of cultural respect women should give men in the workplace, relating that to family life. It was, however, not clear if it was something she figured out after her marriage had failed, or if she had tried it in her marriage but it did not work. Although some participants in O'Connell and McKinnon's (2021) study highlighted intragroup fallouts, a number of participants in this study talked about fallouts they suffered in their personal relationships, seemingly linked to their professions and qualifications.

Theme 3: Expectations in women's cultural lives clash with their professional lives

In Botswana women of a certain age are socially expected to get married, after which they must start having children. Childbearing and child rearing are exclusively attached to motherhood. The fact that it is culturally referred to as bearing children for the husband is telling. There was general agreement that the STEM culture created unwelcoming spaces for women of child-bearing age as the child-bearing process is problematised, making women feel unappreciated and unsupported.

Young women fall pregnant and want to breast feed!

The following participant recalled the subtle disapproval women got for going on maternity leave:

> *The problem with the field was that whenever you went on maternity leave, breastfeeding time, it was always looked at with a lot of disapproval… Eventually you can see that you are not being treated kindly, simply because you occasionally go away on maternity leave. In Engineering you have to be working shifts and you must be there in person.*
>
> *Boitumelo*

Some of these men had families of their own, and yet they still ridiculed a woman for having "*too many children at the organisation's expense*". It makes one wonder if they applied the same principles to their own wives:

> *The lady that I'm talking about, she got pregnant three years or so, in a very short space of time. So, the men were saying "ah! This woman! She has been pregnant her whole entire career in this organisation." …And then I said, "so what is the*

problem?" Someone said, if a woman wants to have kids, she must not think about working in this environment" … "After she comes back from maternity leave, she will start saying she has to go away because the child is sick and asking for permission to be away and it's still going to take time from the organisation".

Ludo

There are laws and policies that govern women's maternity issues, and yet when women make use of those policies they are still challenged, albeit unofficially (Jean, Payne & Thompson, 2014; Kalysh, Kulik & Perera, 2016). This seems intended to make women feel bad as if it is a bad decision to be in the STEM profession, or that falling pregnant in this culture means that the woman is irresponsible. Women need encouragement and positive discussions around their work-life balance issues of motherhood to feel accommodated (Howton, Selzer & Wallace, 2017; Brue, 2018). Negative connotations make the whole experience unbearable and create much negative self-talk and many uncertainties (Kalysh, Kulik & Perera, 2016; Myers & Major, 2017).

While this is a gender issue, it intersects with age as youth is synonymous with childbearing. While looking for her first job, Ouna was told to her face by an employer that he could not employ her because young women fell pregnant. Tebogo shared a quarrel she had once had with a colleague of hers who told her she had too many children, and yet she only had two. This illustrates the challenges women have as a result of their young age and their gender, at the mercy of both national culture requiring them to have children and the STEM culture that expected their lives to move along typical patterns (Kelan, 2014; McCullough, 2020). The same way Tebogo was wrongly stereotyped and judged, a participant in Dutta (2018) was stereotyped out of progression opportunities, despite having decided to forego marriage and family life for a career (Amon, 2017).

After the childbearing discomfort to the employer which usually comprises about three months of maternity leave, immediately comes the breastfeeding hour which lasts for six more months. Although there are work-life balance policies recognising and supporting women's responsibilities associated with motherhood, leaders in the industry look past that with much brutality. In the final analysis these work-life balance policies are used to marginalise women, implying that women should all be housewives. The issue of women being disadvantaged by having to take care of their children came up in almost all the interviews.

That breastfeeding hour was a major source of conflict for the following participant, who only ever made use of this policy twice, when she had her two children:

> *As a woman you must have children because of culture. There are some cultural expectations. At the same time, there is a professional, career expectation. So where do they meet? So, we now see the playing field is not level from the beginning. So, I will always have to take some time off to go and take care of my children. So, they will still expect you to deliver you know. The same way that you were delivering before and compare you with your other colleagues. And then you go on maternity leave. And then you are given that one hour. Remember that one hour?! Hey, your bosses will be like ah! You're going? Who has to do this work? They forget that you also have this obligation, you know, the cultural, the societal obligation, you know? It must be done. And that is the time when you can have some conflict with the boss. So, it has happened to me.*
>
> *Kelly*

The following participant also experienced challenges with the breastfeeding hour:

> *I remember, with the same boss when I had breastfeeding hour, and he would call meetings during my breastfeeding hour, and I had already relayed to him what time I took my breastfeeding hour. Sometimes I'd be in a meeting, then he would drag the meeting. And then I'd tell him, "Look, I must go. My time is up." And then he would tell me "No, I think your son can excuse us." I told him It is the law, so if you want to challenge it, we have to go to court. Otherwise just know that we must obey it.*
>
> *Ludo*

The following participant shared associated challenges from shift work in mining experienced by women of child-bearing age, and how their career progression was systematically stalled:

> *The other challenging thing around shift work and so forth is, you know, at that age, you have reached an age where you are getting married, you start to have children and your male counterparts on the other hand do not need those breaks of having to occasionally go on maternity leave, or the antenatal appointments. So instead of taking the two years you end up taking a lot more time and having a break in between to go on maternity leave and so forth. So, your male counterparts*

will obviously progress a lot faster than you because biologically it's the woman that gets pregnant.

Nchidzi

Although Kalysh, Kulik and Perera (2016) argue that women's work-life challenges do not affect women negatively, they are quick to clarify that such an observation is not applicable to women in male-dominated professions. STEM women leaders of child-bearing age are faced with different kinds of work-life challenges. The STEM culture of long hours and presentism, as well as odd working hours, disadvantages women based on their biological and social cultural burden of pregnancy and associated responsibilities (Pringle et al., 2017; Dutta, 2018); both commitment and performance are questioned. This can have financial implications in some instances (Jean, Payne & Thompson, 2014; Hamzah, Ismail & Zulkifli, 2017).

Some women end up choosing to slow down and sacrifice opportunities for career progression (Beil et al., 2010; Davies et al., 2017). Others opt for lighter loads or take a break from work (Jean, Payne & Thompson, 2014). No matter the choices that women settle for, the disadvantage remains; the men progress while the women are dealing with their "cultural commitments". As such commitments are legally provided for, one wonders why it is difficult for supervisors to plan their expectations of the women accordingly to manage productivity (Brue, 2019; McCullough, 2020). STEM culture has shaped deep-rooted attitudes against women in STEM across all levels of qualifications and experience, from highly qualified and experienced to fresh out of university.

Masego believed that the reason she never struggled with work-life balance issues was because she was a single mother. That meant she did not have a husband to worry about accommodating (Faiz, 2015; Uzoigwe, Low & Noor, 2016; Thriveni & Rama, 2018).

Sub-theme 3.1: Women's complicity

This participant was young and excited to be getting married and having a family, so she was happy to take care of "the whole household" while gainfully employed. Culture dictated her role in the marriage, which she readily embraced. However, it was clear that she was feeling the pressure of being on the hamster wheel:

What I found when I got married, then had a baby… it was very flexible. Like, I think from 2020 When Covid-19 first hit I was working from home. So, pregnancy,

giving birth, having my baby I was working from home…So now I'm learning how not to work from home and balance everything, so it's a bit of a challenge hey. I think the challenge for me, is just personal. First trust issues with having somebody take care of the baby…Like morning routine for me, and evening routine is what will keep me sane…I get to work at eight and start working even through lunch because I got into the job behind schedule. So, I would not have lunch. I would just work until 6pm. Come back home. My husband does not like the helper's food, So I must immediately get into the kitchen… Start cooking.

Boleng

She seemed resigned to the oppressive patriarchal culture that emphasised her homemaker status. The fact that she put it mildly says much about the culture she embraced even as she crumbled under it, literally looking everywhere else for help except to her husband:

He's also in a very managerial role. Very demanding. I've started a new job, I need to impress my boss. You know, he's always been in that role. So that's been our life. So, I can't change that. And for him, people look up to him. He's the manager, the boss…I found that I'm always exhausted. So now I'm doing counselling, not that something is wrong with me. Being the female, I take up those responsibilities. So come back home and the evening you're doing the cooking, then you're putting the baby to sleep … Now I need to sit down with my husband we need to discuss how was the day now we go to marriage life … I want to be super mommy super wife super boss.

Boleng

The following conversation ended with the participant showing me marks on her wrists where she had cut herself, struggling with work-life balance pressure. The participant also emphasised the importance of social support structures, while confessing her own complicity:

My husband helps, well to some extent, Sometimes, you know, I feel although this is wrong when I am sick, that is where he will be more hands on. So, I am like, so you are waiting for me to fall sick? It is not like he cannot help more if he wanted to. It is only that I think I made the mistake of showing him that I can do it myself. I showed him that I am highly capable of just doing most of the house chores and being available.

Tumelo

The patriarchal culture ignores the fact that women nowadays also have regular paying jobs that are just as demanding (Akanji & Nwagbara, 2012; Dutta, 2018). Both participants found themselves crumbling under the load of house chores, stereotyped as women's responsibilities (Uzoigwe, Low & Noor, 2016). According to Sadiq and Ali (2014), the pressure weighed on the women's mental health. This was the primary reason why Lorato quit STEM – to fulfil her cultural obligation of woman as homemaker. Ultimately one wonders about women's complicity in their own subjugation, sometimes.

Glimpses of hope: not all Batswana men are hands-off

There were, however, signs of hope that women were not entirely struggling alone. What seemed to be coming up was the need for women to stop the self-genderisation by asking for help from their partners and husbands. Although Nchidzi argued that the men's lack of involvement was the result of cultural teachings, this looks like a teachable moment. Tumelo also admitted that her husband helped occasionally, though she was hoping for more.

As evident in the following quote, not all Batswana men are unsupportive:

> *what I like is my husband now understands. Weekends I really don't do much like weekend I get to rest and he does the cooking, Sundays he would clean that house. I don't do anything. He also likes the Sundays as his days to do stuff.*
>
> *Boleng*

This is not necessarily something new as I, currently in my late forties, and my two younger siblings were raised by my father. My mother was a nurse and was transferred to a rural area when I was only six years old, and my younger brother was two. My sister was born four years later, and my father raised all three of us, with occasional visits from my mother whenever she could take leave.

Notwithstanding the changing times, Slaughter (2012) concurs with Tumelo that letting go of the traditional wifely duties of solely raising children is a challenging decision, even for Western women. These women have the advantage of a culture that has been more open to stay-at-home fathers supporting wives with more demanding and sometimes powerful jobs. But in Botswana the culture is often non-negotiable when it comes to stay-at-home-husbands, whose wives would be accused of bewitching them.

I recently had a conversation with a friend who was about to join the African Union and would be relocating to Ethiopia as a result. She said that it was not an easy thing to convince her husband to drop his small business in Botswana to move with the family, for the same reason. The husband felt emasculated by the thought of having to follow his wife to another country and being the one taking care of the family while the wife put food on the table. That was also reinforced in conversations he had with other family members and friends who undoubtedly meant well. Culturally an ideal Motswana man has to earn more than his wife. Some of the married participants even complained about the burden of having to prepare food for the family while the husband is sitting on the couch, television remote control in hand, despite both coming from work. If there are school going children, then the wife also has to see to it that they have done their homework.

5.5 Research objective 2

Establish how STEM industry culture systematically impacts women in Botswana STEM leadership

Theme 4: Constantly having to prove yourself beyond (un)reasonable doubt

Although this is about the convergence of gender and STEM culture, the influence of national culture in "the weakest link" perception of women in STEM leadership prevails, as facts often do not seem to matter.

The following participant learnt to be assertive from the experience she had while leading a team that did not respect her on a construction site, turning the site into what she called *"ko ga mmapereko", (an unruly household)* because of unmanageable subordinates:

> *I walk into that office like a monster because I know if I'm not strict and shouting, yay! They will walk all over me. You must always be on top of your game. Know everything technical on site, because if you don't, they make a laughingstock of you, in a meeting full of clients.*
>
> *Boleng*

The next participant was terrified of being judged harshly on her every performance. She therefore had to always be on top of her game to prove that she was not an imposter:

> *I did a lot of research throughout my career. I would ALWAYS! Do thorough research before a meeting, before I did a presentation, I would make sure that it is*

spotless! I certified, I studied…And then just doing thorough research, always making sure that I am one step ahead of all of them. Sometimes it was extremely difficult. I don't want to lie to you. Especially when you are trying to do something and people are constantly trying to put you down, be it your colleague, your boss, sometimes it was really demoralizing.

Neo

The following participant had to work extremely hard to prove that she belonged:

With time they started realising that "ok, she is knowledgeable in these things, and they started realising that the man who had been acting did not quite understand a lot of things. After a while, thing turned around, reports started coming on time, and suddenly we started being praised to the extent that we won 'best department' in 2017. I was happy just thinking that we came from very far to get here. After a while they started respecting me as a person.

Kate

Women leaders not only have to look convincing, but must constantly concretise it with performance (Gray, O'Connor & O'Hagan, 2018). Neo's pressure to always be perfectly spotless in her performance spoke to my personal experience of STEM and the reason why she left in the end. For some time it felt like a desire, until it started feeling like the only option.

Men's competence and ability are readily accepted, while those of women are readily doubted (Gray, O'Connor & O'Hagan, 2018; Cohen, Duberley & Fernando, 2019). According to a participant in a study by Gray et al. (2018), men generally are confident, irrespective of their ability. That is because men always have the winds of culture at their backs, as men are the designated leaders. This results in a gender bias that creates a conducive environment for men to thrive, while on the other hand demanding from women to earn consideration and causing women to struggle with imposter feelings (Clance & O'Toole, 1988; McCullough, 2020). Trying too hard is unnatural for men, but very natural as an anchor for women's existence in STEM (Hawthorne et al., 2013; Johnson & Widnall, 2018). Every assignment a woman is given is judged in isolation and the woman has to validate herself repeatedly (van Veelen, Derks & Endedijk, 2019).

The consequences of a woman's missteps were not lost on these participants as they emphasised success as the only possible outcome for them. Regrettably, that is not always possible as the measure of excellence is not always clear. Despite her meticulousness, Neo was demoted (van Veelen, Derks & Endedijk, 2019). This sounds like reverse imposter syndrome: while these women were extremely confident of their capabilities, the observers seemed to be waiting for them to falter. Men as the dominant group in all of these scenarios eagerly defied women's authority to discredit them and protect their own power dynamics (Carter & Sims, 2019; Miner et al., 2019). The men pushed the envelope to check the temperature of the women and how it would play out. All the participants had a related story to tell and all of them had had to invoke their positional power to manage the situation (McCullough, 2020). Unfortunately some women might not be able to withstand the negativity for long and choose to leave (Tao & Mcneely, 2019).

Sub-theme 4.1: Women in STEM: Outsiders within

Gender and STEM culture converge in women's lives in ways that influence their experiences. The culture-influenced resistance to women's STEM leadership was discussed in the previous themes. Women's early STEM leadership experiences were used to put STEM culture into perspective. Some of these women may have been young at the time of such experiences. However, it is the STEM culture's consideration of their gender that this theme focuses on.

The following participant shared her frustration at the lack of recognition of qualifications, skills and experience she gained through the years because of her gender:

> *Introducing myself as a quantity surveyor does not make a difference. It does not take away that thing, that you are a woman. I have done soo many projects! Sso many! And it is the same, you know! Whether you are in a project with a totally different contractor, you go to the next project, same thing! It is annoying.*
>
> *Pinky*

Similarly, this participant was respected as a leader and as a person by her subordinates but was not afforded the same respect as a STEM leader. She did not fit the STEM leadership mould and was therefore "othered" in her position as a general manager of a multinational power-generating company. Her years of experience working for the national power company which arguably qualified her for this position suddenly did not count:

But when I left and joined the private sector, I still felt the same thing. Even though I was the general Manager, of the company, the technical side felt that they could not be fully under me. They had to be led by another technical person who was not even in the same country.

Ouna

Katherine Johnson, a "pioneer extraor- dinaire and a brilliant mathematician" remained an outsider within, despite her genius anchoring the National Aeronautics and Space Administration's (NASA) initial space missions (Shetterly, 2016). The white male engineer leaders begrudgingly accepted her into their briefings because women were prohibited from such meetings (Johnson, 2008; Shetterley, 2016). Unfortunately members of the preferred gender and race did not have her prowess. According to Katherine Johnson, the white men respected her for her knowledge, and as such, they did not have a choice. Even the astronauts, preferred her hand computed calculations over the computers (Johnson, 2008). Decades later, the increased number of women graduating with STEM qualifications has not reduced the scepticism about women's ability. STEM gender intergroup dynamics of belonging cause an exaggeration of women's outsider status (Canham, 2014; Leaper, 2015; Gray, O'Connor & O'Hagan, 2018). When Neo joined <name of organisation>, she interpreted her reception as disappointment and disapproval. This organisation, being in the mining sector, was her first encounter with an organisation that was hardcore STEM.

Baptism of fire

This subtitle underscores the overwhelming and intimidating experiences right at the beginning of women's leadership years. Such experiences have the potential of scaring and scarring women into fearful insecurities. Most practical STEM jobs rely on semi-skilled workers, meaning these women assume supervisory roles early on and, as Kate mentioned, these are the groups of people who often do not filter their thoughts, no matter how unpalatable they are to the women.

The following participant's experience when she first joined the industry was scary and borderline discouraging:

I was on standby at the time, so they would call and say we are experiencing a problem in the plant so we are sending a vehicle to come and pick you up…When the vehicle arrives I try to get in the car and the driver says "What are you doing?

Where is the man you live with?" I ask him, "a man?" He says, "Yes! I was sent here to come and pick a man to go and fix something at the plant." I explained to him that I do not live with any man, and that I was the person he was looking for, and he told me to stop wasting his time and drove off leaving me standing there.

Nchidzi

The next participant's early leadership experience was not flattering either. Her much older subordinate thought he could just come to work on his own terms, ignoring company policies:

I find a message, 'I do not have transport, so I am going to be late' or something like that... (later) I find this guy in my office. "Oh morning" then I can see that uh uh! He is not happy, so I just got in and sat with the door open. We were just sitting like this! (illustrates close face to face) and he was like a big guy! He says to me, 'Why did you tell <name> not to come and pick me?" "Ok morning to you too, and why are you talking to me like that, and maybe let us start with how the whole situation came about." I told him, "You know the policy for using company vehicles … and he just started shouting, saying who do I think I am, and I am new in the industry, if he wants he can destroy my reputation and close doors for me, they have been in the industry for so long and he has connections…I was 33 and the person was like 40+.

Tapiwa

Women's experiences when they joined STEM did not seem to be that harsh. However, what seemed to apply across the board was the experience of marginalisation, showing them that they did not belong (Cabay et al., 2018; Yang & Carroll, 2018). The much older male subordinate took advantage of the fact that his young woman supervisor depended on his experience (Morris & Washington, 2018; Yang & Carroll, 2018). That, compounded by the masculine STEM culture, blurred the lines of authority for the male subordinate. This had the potential to destroy the women leader's self-efficacy and professional identity (McCullough, 2020; Clark et al., 2021). During the interview it became quite evident that it was such experiences that shaped and defined the women's characters as they were forced to toughen up. Of course, some chose to cut and run like the young woman intern mentored by Ludo who decided to quit and join the hospitality industry.

Subtheme 4.2: When what is good for the goose is not good for the gander.

The participants shared experiences of double standards where they would be treated differently from their male counterparts. This participant did not have the luxury of not doing the given assignment which her male colleagues easily ignored, with no consequences. On the contrary, her effort was taken apart:

> *You know, I would be now as the Director of Technical services, other Directors would be men, then we would agree in the boardroom that ok let us do such and such...You know we would come back to the boardroom, everybody would not have done the assignment, and I would have done it. People would now start critiquing my submission. The fact that other people have not submitted, is overlooked. Now it would be like you did this and why not this? It would be me being hammered for having tried to do something…the situation was that tough. You had to be strong.*
>
> *Mmabatho*

Because women had no place in STEM, a younger man was accepted and supported, while the younger woman's advantage of longer service could not save her. She was accused of a myriad of reasons for her promotion:

> *I saw it happening to me. Remember that I was promoted same time with the Structural Engineer and the difference in our age is 1 year, yet there were no stories about him. I used to cry, and he used to console me saying but why is it that he did not experience any struggles. And I would say to him "it is because you are a man. Automatically people respect you because you are a man. People do not even see your age, yet they see it in me, and you are only 1 year older than me." ... "And your promotion is the one that should have been associated with sexual favours because you only arrived yesterday and now you are here with us. And he said I realise that my friend. The way you are crying and the way you are struggling, I am shocked!" I said to him I saw it with me. The fact that for my supervisees to respect me, I had to jump through hoops. I had to show beyond reasonable doubt that I know what I am doing and not just once but multiple times.*
>
> *Kate*

The following participant tried in vain to explain herself because she did not qualify to be listened to by either her subordinates or her supervisors. She was a woman and therefore did

not know how to lead in STEM, even when she was doing the same things that her male colleagues were doing:

> *because EVERY WEEK! I was called for meetings by three men. Telling me that I should stop bullying staff, and I would ask what have I done wrong? Don't you give me assignments? Don't you give me targets for assignments and deadlines? How is that different from the supervision I am giving my direct reports? Why is it that you can give me assignments, but I cannot do the same? Is this not the same environment that we are all working in according to targets and deadlines?*
>
> *Masego*

The most recognisable thing about Kate was her sexuality, hence the "yellow-bone" promotion accusation (Cohen, Duberley & Fernando, 2019). As a new person at the station, her accusers did not know much about her, which is why the accusations were many, all centred around her gender (Hyman, Wilkins-Yel & Zounlome, 2019; McCullough, 2020). The men who worked with Mmabatho, on the other hand, banked on their dominant group association which gave them the liberty to self-handicap. The narrative was that they did not do the assignment because they were too busy, while she did a shoddy job because it was too difficult for her (Grove & Prapavessis, 2015; Ferradás, Freire & Piñeiro, 2018). Ferradas, Freire and Pineiro (2018) associate this behaviour with self-handicapping, which men tend to apply more than women due to the nature of the double standards in the assessment of women's and men's performance. Because of the negative perception of women in STEM, she would likely have been perceived as a failure if she had similarly decided not to complete the assignment. Being the only woman in senior leadership tokenised Mmabatho and subjected her to scrutiny, as an outsider within. Despite always working harder than the men, it clearly won her no accolades (Blackburn, 2017; Ruel, 2018).

Theme 5: Bullying and intimidation of women

The participants indicated that they were bullied in the workplace, despite having the requisite qualifications to validate their presence in STEM. Suddenly the same men they studied with started enjoying better treatment, while the women were considered young, inexperienced, and mediocre. The men holding leadership positions often placed men above women holding similar qualifications. This preferential treatment of men is not justified, as at this level of engagement there is no physicality required which would supposedly advantage men.

The following participant described the intimidation and bullying of women in STEM:

> *When we get to the field, we get there with so much expectation! [emphasizing] we went to school together, we wrote tests together, we wrote exams together we never got to hear this boy child saying "I got a 90% that is different from yours. Suddenly we get to the workplace and then they start bullying us, because its bullying most of the time, because they intimidate us to not want to be in the same environment. Most of them believe that power is earned through your gender.*
>
> *Dolly*

The next participant questioned the negative treatment thus:

> *but I always say "what are you doing that I cannot do? You are not doing any manual work, you are not lifting anything, so the knowledge that you are coming with, I too went to the same school. We were literally in the same class. And what we saw even back in class at school, the women were even doing better than the guys. Like me from my class, the top 2 we were both women. So, it was like where do you think now that change is going to come from because when we get here, it is still just the things that we learnt at school, so we are here doing the same things, so there is no difference. like… you are an Engineer! I mean really. You do not go into the trenches.*
>
> *Kate*

It gets worse with this participant who was put down by a male colleague with identical age and experience:

> *I remember this guy, yeah, the guy is a year older than me, which means he graduated a year before me. I have more than 20 years' experience. So, it means he is just plus one. In a meeting, I talk about something, and instead of commenting on what I had commented on because I was basically demonstrating that there is something they had not done in his department. And his response was, "The likes of you Nchidzi need a bit of experience so that you can make such comments."*
>
> *Nchidzi*

These experiences speak to the extreme lengths some men go to with bullying and intimidation of women (Diehl & Dzubinski, 2016; Hollis, 2018). Being labelled inexperienced, 20 years later, by an agemate, affirms the unstructured nature of men's undermining of women, whether

younger, older or the same age. Some men use words that devalue women with the intention to diminish their authority (Engendering Success in STEM, 2019; Diehl & Dzubinski, 2023). Getting such comments can be quite destructive to women's sense of belonging (van Veelen, Derks & Endedijk, 2019). Research shows that the bullying can also affect women's health negatively (Hyman, Wilkins-Yel & Zounlome, 2019). Dolly shared how she used to feel sick every time she came out of a board meeting because she felt bullied. Nothing says "You do not belong here" better than what these women experienced (O'Connell & McKinnon, 2021; Mangolothi & Mnguni, 2022).

The women's confidence was already culturally battered, and the STEM culture validated the cultural beliefs they grew up with, reinforcing their sense of second-class citizenry.

Leading on eggshells

Over time some of the women developed coping strategies to help them navigate the STEM leadership terrain. Older participants, overall, tended to negotiate their acceptance into the profession, instead of "meeting fire with fire":

> *You just have to work around the individual until they understand you. That you are not out to get them. That you are not invading their domination space. So, it's a challenge because some attitudes are always very difficult to change. And that is how it is…But you continue not necessarily like stamping your authority but like you have to have good tactical skills to be able to manage certain difficult characters. Otherwise, hey! You can quit. And if you are a woman who cries easily going to work would be a nightmare.*
>
> *Masego*

The following participant was a chief executive officer with a degree in a relevant engineering specialisation, as well as relevant experience. However, her subordinates would rather seek help from an out-of-country executive for all technical challenges experienced. It can be seen here, again, how some women, as they grew older, tended to embrace their gendered experiences, and choose to lead from behind:

> *So, you're here thinking you are managing them, but when they think there is a more serious technical problem, they want to be led by a man…It has not really affected my drive in what I want to do. I have also seen that sometimes you can lead*

from the behind. Like where I am now, I lead from behind because I have younger people working with me.

Ouna

Both participants negotiated their acceptance by their subordinates as they decided over time that fighting was not benefitting them. Kyriakidou (2012) calls this "redefining the self", as the participant chooses to positively engage the stereotype instead of fighting back. Both participants chose to lean on their women' leadership traits of kindness and nurturing as a crutch for survival and a tool to negotiate acceptance (Loubier & Richardson, 2008; Hatmaker, 2013; Carli et al., 2016). The masculine discourse of STEM is the norm in patriarchal societal cultures, as women are located outside the leadership frame (Hamzah, Ismail & Zulkifli, 2017; Dutta, 2018). That makes women's navigation of leadership painstakingly non-linear and unpredictable. As one of the participants in Dutta (2018) posits, STEM women do not have to fulfil the cultural narrative of woman as wife and mother to be marginalised. They just need to not fit into the leadership frame that is equated with the male gender. Although these participants were in leadership positions, their experiences remained gendered, and they seemed like willing participants.

Theme 5.1: Sexual harassment and STEM power dynamics

Young women in STEM jobs find themselves valued only for their sexuality by their supervisors who most of the time are men. Some of them fall victim to the objectifying culture that only recognises women for their looks. The threat of the men's reaction to rejection coupled with the culture dictating that young people cannot talk back to elders has the potential to contribute to the victimisation of the women.

The following participant shared a situation where a younger woman she worked with was used as a prop for her looks. This, unfortunately, did not seem to benefit her professionally as she would not be involved in any meaningful work. All that was expected of her was to just sit in meetings with clients, most of whom were men, and look pretty:

There was another young woman engineer that we were working with who was being turned into a…you know how they always say the receptionists are just the pretty ones. She was always taken to meetings with clients because those other guys would not be shouting as much as they would normally do. She was used to distract them. I would ask her, what was discussed at the meeting? What did she do at the

meeting? No, it is just to go and literally just go and sit there. Sometimes he would give her money… I think she was okay with it for whatever she was getting out of it.

Tapiwa

Unfortunately, there was a pattern of behaviour, as this participant was also sexually harassed by the same supervisor. He dangled opportunities for her to be engaged in meaningful tasks in exchange for a sexual relationship or risk the consequences, a hurdle that her male counterparts did not have to contend with:

"This project is coming, and when it comes you are going to be doing ABC." You are going to be doing this and that. Then you will just hear that the project has already started, people are going or something and I am like "did you not say I was going to be…?" "No, eish! You know those ones are difficult so now I want you on that one in Gaborone so that you can still stay home, stay with your daughter." After some time then the attitude changes towards me then it is like he starts complaining, hostility start. I am seeing that I am not growing, I am not being given opportunities like everybody else. Others would be taken to site, while I am just made to do the same thing…The ones you will find in construction, are the ones who are undesirable, accused of being difficult. The vocal ones are the ones that you can find in such projects. When men try to hit on them, they are like no I am not doing that.

Tapiwa

The following participant shared her experience of sexual harassment in a different country where she started working:

I started working in Port Elizabeth. It was quite challenging. You are trying to learn and get mentored. And first of all, you come into an environment where I don't know if you'll excuse me, but most old White men they look at like a female young Black woman, as you have to do something for me to earn more money or to get a permanent job or something. Like those offers were there. Because I didn't have a car like "oh, can I get you a car?" But someone is not really saying what you must do in return, you know!

Boleng

The sexual advances were unnerving for the participant and quite disruptive to her learning process:

> *I know some experiences in the end they don't end well. Just because you said no to somebody and then they start being funny. And obviously you're talking about older men who would be your supervisors that destroy the relationship. I mean, I think it disadvantages you as a woman. Because funny enough, like in my incident, in Port Elizabeth, the person who did that, He's the one taking me to these projects. And you want to feel comfortable to ask questions. Eventually when he says he is going on a site visit to a five hour drive away site, and you obviously going to sleep over, you end up refusing that opportunity because of the discomfort of driving so long with that person…now you can't gain knowledge from that person freely.*
>
> *Boleng*

As a young leader in one of the professional associations, the next participant engaged with other young STEM women and helped them with the personal challenges they experienced in the STEM environment. She recounted a story she had been told by a younger STEM woman who confided in her about her own sexual harassment by her older male boss:

> *Some of these topics always come up like "at my workplace there is this guy who has been bothering me. He asks me to go with him on trips, like when he has to go on a trip, he recommends me all the time and when we get there, they are just being weird" Someone was like when they got to a hotel, she found that the guy had only booked one room.*
>
> *Tapiwa*

The following participant confirmed Tapiwa's claim that the "undesirable" women had it easier, as she decided to employ the strategy of being undesirable to ward off sexual advances from the male supervisors:

> *I had to be male a bit to get to a certain level because some of the male supervisors, now they want to sleep with you, you see. So, there is also that to navigate, so you get to a point where you have to be like a man so that they forget that you are a woman and lose that interest of wanting to sleep with you. Like, my supervisor says I am a half man.*
>
> *Kate*

Sexual exploitation is, however, something that only the younger participants acknowledged as a challenge in their work life. The older participants suggested sexual relationships at work were either consensual or non-existent. Some even complained that it was sometimes falsely used to downplay women's achievements. When probed about sexual harassment experiences, the following participant was emphatic in denying that it had ever happened to her:

> *I've never had any sexual harassment experiences or sexual requests for favours. Never! But I have seen it that is quite prevalent in the younger generation that is coming up you know. I always find that they are almost always so easily impressionable and easily flattered by these gentlemen that we work with. And they can be convinced that they are superior you know. For example, when they are in a relationship with a person who is my level then they would like to come and talk to me as if we are colleagues because maybe in the bedroom, they have gotten some information that they shouldn't have gotten. The ones that are like 10/20 years difference in experience.*
>
> *Ludo*

According to Kanter (1977), the objectification of women makes it impossible for them to be viewed as anything else apart from sexual objects. The experiences and observations of these participants are an example of the invisibility suffered by women and their professional talents due to the sexual objectification faced by young STEM women (Barthelemy, McCormick & Henderson, 2016; Guizzo & Cadinu, 2017). The primary power dynamics between an experienced immediate supervisor and a young woman desperate to learn threaten young women's identity as worthy STEM professionals (Kelan, 2014; Johnson & Widnall, 2018; Cohen, Duberley & Fernando, 2019). The undesirable women are fortunate enough to escape this culture-induced barrier as they do not have the sexual hyper visibility (Kelan, 2014; Blackburn, 2017; Spiegel, 2023).

Some of the offers can be tempting, resulting in women allowing themselves to be taken advantage of (Clance & Imes, 1978; Still, 2020). The challenge is that over time this can turn into a career-limiting factor (Settles, Cortina, Malley & Stewart, 2006; Blackburn, 2017).

Interestingly, the older participants denied having experienced sexual harassment. One wonders if they forgot, or if it was normalised in their generation (Still, 2020). This illustrates slight cultural diversions influenced by inter-generational differences. Ouna acknowledged it

in a different light, as her concern was more about women being accused of giving sexual favours for promotion, something which Kate was open about experiencing (Bhalla & Inna, 2019). When E. Jean Carroll was recently asked during a cross examination in a case against former American President Donald Trump why she was only bringing a sexual assault case from the mid-1990s to the courts more than two decades later, her response was that she was "born in the silent generation. We put our chins up and went right ahead with smiles on our faces" (Carroll, 2022). The older participants were much younger than Miss Carroll, but it is evident that the culture of not believing women was relatively similar for the older generations.

5.6 Research objective 3

Establish the reasons for continued male dominance in leadership of the Botswana STEM leadership

Theme 6: The gendered manifestation of STEM leadership

All the participants had had relatively good career trajectories. Most of them were able to reach middle management, though not without a fight. Unfortunately, being knowledgeable and in control of what they needed quickly faded away when they reached middle management and their careers faltered. The older participants admitted to the sudden halt to further progression. There was a constant barrage of battles, one after the other, often with few to no rewards. This theme captures how the STEM leadership played itself out in ways that mostly benefitted men.

The following participant got to a point where she felt that her hard work was not being adequately rewarded, an occurrence she felt was a norm peculiar to women:

> *Maybe the weakness in this country is that, even though you reach middle management, it is like there is a cap, in terms of who can go beyond middle management… and then you reach a point where you are almost at the same level and it is a daily challenge to try and prove yourself every day, because basically that is all you do. I make sure that I learn wherever I go so that no one says, "she doesn't know anything." So, when they disregard me, it will be because they feel threatened or they just don't want a woman.*
>
> *Ouna*

The next participant shared her experiences as a decision maker where she felt that promotion decisions were based on gender instead of capability:

To be quite honest, it is difficult. It is difficult Sandra. I have been in boardrooms where we had discussions around placements, around performance appraisals as management, and the type of comments that come with women candidates versus male candidates! You know where literally I felt that this person is now fishing. Where women's competence is challenged, their merit is challenged, where leadership would naturally take the man's side or want a man for that position over a woman because of their numerous reasons, some valid, some not valid.

Neo

There seemed to be a deliberate move by decision makers, often men, to frustrate women and keep them in lower positions as trench diggers with minimal decision-making powers yet expected to do most of the important work. Due to the lack of clarity as to why their hard work was not paying off, some decided to leave formal employment to start their own companies.

The following participants shared experiences which support this claim:

It once happened at <name of organisation> where my boss, I mean, was never appreciating my efforts. Like, I was always given the average, like the bonus that I used to get really! It was disappointing. Up until the Managing Director, the one who recognised my efforts, and I got an award… Obviously, because you will be thinking, you will be feeling that they have to match your experience. And the moment you do not get that reward from your employer, it will be now time for you to leave and be on your own.

Kelly

One of the recent lows was that my boss was trying to push some corruption, circumventing policies. I was a hinderance by virtue of my position. There was nothing that could advance without my authorisation. So, the low was that I was removed from that position despite being the only person qualified in the whole organisation. I was moved to a lower position and replaced with an under qualified man. It was victimisation and abuse, literally. And that is when I decided to leave the corporate world and start my own company.

Neo

The fact that this participant was appointed to lead important projects attests to her ability to deliver high level projects:

> *When new things were being introduced in the organisation, you know I would be made the person made to lead the team that is bringing the transformation into the organisation. You name it! Enterprise-wide risk management, I am the one who introduced it in the organisation. I lead the team to do whatever! When it comes to appointments, or somebody is needed to fill a senior position, some guy gets the position then I will be given some stories. You know I was leading the team that was doing the microstructure of the organisation. And then after restructuring at <name of organisation> I then became General Manager for <area>, so it is a very difficult area. Who gets it? It is me. Then after restructuring was completed, suddenly some guy who is even a chemist, who had just been working in a lab, gets promoted to the position of Infrastructure Operations Director while I am overlooked. I was sooo mad!*
>
> *Mmabatho*

It seems to be a common phenomenon among STEM women leaders that they generally seem to progress with relative ease until they reach middle management. After that the "glass" barrier manifests and obstructs women's progression pathways (Amon, 2017; Derks et al., 2017). Men start taking glass escalators which are invisible to women, while the women are "stuck to sticky floors" (Bilimoria, Lord & Marinelli, 2014; Dahmen & Thaler, 2014; King, Leavell & Maniam, 2017).

The participants concurred that STEM women were systematically discriminated against (Combahee River Collective, 1977; Corneille et al., 2019). Systems of oppression were created as gatekeepers to ultimately stifle their progression. Although the study by Liu, Brown and Sabat (2019) was based on the experiences of women of colour, its findings on the consequences of refusing unlawful instructions reflect what Neo experienced resulting in her demotion. If women's hard work does not benefit them, then who does it benefit? (Rossiter, 1993; Glynn, Huge & Knobloch-Westerwick, 2013). Such experiences embody the Matilda effect, as the benefits of these women's performances are channelled towards their male counterparts who are unduly promoted (Rossiter, 1993; Kretschmer, Pudovkin & Stegmann, 2011; Glynn, Huge & Knobloch-Westerwick, 2013).

Sub-theme 6.1: The inclusion of women in STEM is just a song

Many companies in Botswana have in recent years jumped onto the gender equality bandwagon. Unfortunately, the poorly conceived initiatives in some instances seem to do more harm than good as they create undue scrutiny and misconceptions around women's leadership capabilities. As a result, women are turned into gender diversity props, amounting to very little.

If this participant was good enough to be promoted to middle management, one wonders what changed, especially with twice the amount of experience of the men who became the sole beneficiaries of progression opportunities beyond middle management:

> *Imagine that the interview that I forced my way into? It was only going to be 6 men in the interview with no woman. And they need no effort to make sure that there is a woman in the interview because only one qualified. Which means for them it is just a song. Diversity and inclusion are just a song.*
>
> *Nchidzi*

A few organisations have been very vocal about diversity and gender inclusion. A few years ago, <name of organisation> where this participant worked decided to go on a gender equality drive by elevating a group of women to middle management. Although it looked like a good initiative at face value, the execution seems to have done longer-lasting harm than good to the cause. According to Nchidzi and Neo who both worked for this organisation, the women were not respected and were now called "gender managers" (Ncube, 2018). Even though the women were progressed to a certain level, the opaque nature of the criteria clouded the capabilities that some of the women might have genuinely had.

Women's glass ceiling and men's glass escalators: Baseless notions of gendered superiority

This participant's prospects of passing her interview were handicapped by the misogyny that seemed to be the norm in the organisation. She was overpowered by the gender burden, causing her to give up without trying:

> *"We are going to take you through the interview, and this is how it is going to happen." Now, instead of starting to answer the questions, she starts crying and you know what she says? "What is the point of me sitting here … because I know that already you have identified someone for this, and I know who you are going to give it to him." This lady was one of the people that I shortlisted to come in for the interview. She was hardworking, I mean, at one point she was a superintendent,*

and I knew that when we want now to promote somebody to Engineer level, she was highly capable. She knew water supply and water treatment with her eyes closed. Now here is a guy coming who does not know any of these things and is handed the job.

Mmabatho

The following participant battled the misogyny the same way her female subordinates did:

Guys were coming, new to <name of organisation> and getting promoted ahead of me. I mean we knew that in terms of progression that if I am Area Engineer for <name of region> and I am still wanting to move in operations then the next big areas would be Gaborone or Francistown and obviously even the salary is higher, then I would go there. Instead, when a position becomes vacant, a man arrived from a completely different government department, with absolutely no experience in water engineering.

Mmabatho

Mmabatho's relevant experience could not save her from being overlooked for promotion over inexperienced men. Unlike Kate whose age was bandied about, Mmabatho was clear that for her it was only gender, as they were all agemates.

The following participant argued that the glass phenomenon was a result of brotherhood:

It's a male-dominated industry. And I think maybe a lot of decisions are not really made in the boardroom. A lot of the decisions can be made outside the boardroom, with other elements to them that a lot of women are not privy to… Let me say it would not be a problem, if there's a corporate function, and then even at the corporate function, there are always the divisions that are there, but also a lot of men take a lot of liking to each other at the corporate functions, and then the networking grows in that format as well. And I think a lot of men see themselves as superior.

Ludo

This participant watched in shock as she was unduly excluded from a progression opportunity and more so, because it was by other women, a phenomenon which was also pointed out by Masego:

It happened to me last week neh! So, there has been a job opening and it was advertised. I apply, my male counterparts apply, experience 10 years and, like I said, I have more than twenty years' experience and I got rejected by women in HR. The only woman that qualified for that job. And yet you call my other colleagues with around ten years' experience and reject me with twenty plus.

Nchidzi

When women join the STEM employment they naively expect to be buoyed by their hard work and propelled to leadership positions, only to see in some instances less qualified men taking the glass escalator. The glass escalator is associated with the advantaging of men over women, in feminine jobs (Hultin, 2003; Casini, 2016). I however, concur with Diehl and Dzubinski (2023) that male privilege ushers men into glass escalators across all industries. In order to protect the privilege, men take advantage of the resulting power dynamics and promote other men (Ahuja & Weatherall, 2022; Atewologun, Sealy & Vinnicombe, 2016). Interestingly, masculine opportunities for social interaction get recognition as providing opportunities for progression (Cerullo, 2023). This sounds like yet another excuse to place promotion opportunities beyond women's reach.

The tokenising of women leaders

As a result of the poorly implemented diversity policies, few women are able to make it to top leadership positions. That results in deliberate tokenising of women to just be there to look pretty while their voices are drowned by the dominant male voices – and be blamed for it. Consequently, these women's shortcomings are projected to the rest of their gender.

The following participant shared an example of her tokenisation by her male colleagues, one of whom had called her inexperienced despite her 20 years of experience:

Once we were restructuring so it meant that people literally did not have jobs until the structure was populated with names. Obviously at my level it is just me and the guys, so when I got there, I found that, the people that are at my level, they had populated the structures. When I carefully looked at it, I realised that not even a single lady had been given a job, not one! And to make matters worse, there was one guy who had been offered two jobs whereas there was a lady who also had the same qualifications, the same experience as this guy. They didn't see anything wrong with it. It was war!

Nchidzi

Since men formed the majority in leadership, with only one woman, they found an opportune time to exclude her from the re-hiring exercise in order to disadvantage women in her absence. They were basically casting judgement on the women, implying that they were not good enough (King et al., 2010; Seron et al., 2018). Tokenisation of women has long-term consequences for women's careers, as it has the potential to reinforce the women's imposter feelings (Stichman, Hassell & Archbold, 2010). As the lone female voice in leadership, Nchidzi was not expected to make a valuable contribution in her male colleagues' opinions, hence she was not given the opportunity to participate in the selection process (Stichman, Hassell & Archbold, 2010). Even worse, the fact that no woman was selected for a job illustrates how poorly these men thought of Nchidzi as the sole representative of women's capabilities. Nchidzi demonstrated all perceptions resulting from tokenism, namely assimilation, high visibility and contrast (Stichman, Hassell & Archbold, 2010). It is evident that women may have a seat at the table but remain voiceless cheerleaders (Kovalainen & Poutanen, 2013; Dolgin, 2017).

Sub-theme 6.2: When women in STEM adopt masculinity

STEM women are constantly grappling with the dilemma of being considered either too much or too little, but never just right as leaders. To fit in, some of the women adopt the prototypical image of masculinity with the hope of blending in.

The following participant admitted that she had become masculine to fit into the STEM culture of toughness which was clearly unappreciative of feminine characteristics:

> *I have realised that women in construction, we become so hard. You can lose that feminine part of yourself. You can become too much of a man just to fit in. Because eight hours you are thinking like a man so much that when you get home you don't have that nurturing element in you…They now tell me that they forget that I am female, that is how too much of a man I had to be to earn their respect as an equal in the industry. I remember I had to go on entertainment outings with the guys just so I become part of that group of men, just so they can accept me. Always asking, "where are you gents?"*
>
> *Kate*

The next participant, however, acknowledged the downside of taking up masculinity in STEM, as women were also frowned upon for "behaving unnaturally". It does not look as if the masculine women were better off as they seemed to be stuck at the same place as the feminine women, suffering from the same glass ceiling:

> *And you have to prove a point, the next thing you are accused of behaving like a man. "She has just turned herself into a man".*
>
> *Ouna*

Unfortunately, such efforts by the women to differentiate themselves from feminine attributes unwittingly perpetuate gender stereotypes (Engendering Success in STEM, 2019; Lendák-Kabók, 2020). While such behaviour might reinforce the woman's position, it can only place her above other women and not necessarily as an equal among men (Kovalainen & Poutanen, 2013; Adams et al., 2014). Furthermore, it may even affect intragroup relationships among women themselves (Benjamin, 2020; O'Connell & McKinnon, 2021). Kate's efforts to fit in unfortunately might not serve her in the national culture as "self-respecting women" stay away from certain places, which is a double whammy.

I still feel aggrieved by gentleman who interviewed me for his doctoral study in the early 2000s. Although I cannot recall his exact words, I remember that he mentioned how some of the men he had interviewed had told him that myself and another woman in the industry behaved like men, which somehow threatened the men. Looking back, however, I do concede that there was an element of truth in their words. From the first creative project I came up with and throughout my time working in the STEM sector, I constantly had to defend myself against sexism and invisibility.

The STEM leaky pipeline: STEM is not for fainthearted women

The STEM women's leaky pipeline drops women at different levels of the ladder as they are overwhelmed by pressures stemming from the gender-based hostilities they are experiencing.

The following participant shared several experiences which she believed were aimed at proving that women were wrongly placed in her job. The fact that she never wanted to go back to electrical engineering reflected her trauma:

> *Even the merging of posts, sometimes you would just feel that it is deliberate. They want to put more pressure for you to end up quitting. That is how I felt…Eventually*

it got so boring, so much that by the time I resigned I did not want anything to do with engineering anymore because after resigning, my husband proposed that I join him because he worked in a consultancy. They occasionally had job openings for electrical engineers, but I was no longer interested. I completely lost interest I never did anything to do with electrical engineering after resigning from <name of organisation>. [10 years later]

Boitumelo

This participant's protégé quit the industry for a completely unrelated field despite her support and guidance:

I have one graduate that I was mentoring, who just up and left STEM, and started a flower arrangement company. But you know, with her I could not actually see if the problem was STEM or if the problem was that she's not passionate. But I always felt from just my observation, that there was a lot of intimidation on her at the area that she was working. She worked with a lot of men around her. So, I thought there was intimidation.

Ludo

Boitumelo was "leaked" after several years of trying to hang on and prove a point, fighting an unwelcoming and prohibitive work environment (Master & Meltzoff, 2020). Her work-life requiring her to travel regularly was not accommodative of her family life and caregiving obligations (Clark et al., 2021; Arredondo et al., 2022). The constant pushback and struggle became too much to bear, meaning that though she resigned, it was not out of her own volition but under duress (Dasgupta, Scircle & Hunsinger, 2015; Swafford & Anderson, 2020). Lorato, on the other hand, jumped ship a few years after having graduated due to her desire to have a family and be a present mother, which she believed was irreconcilable with the STEM environment of presentism (Gray, O'Connor & O'Hagan, 2018; Master & Meltzoff, 2020). She did, however, associate her desire to have children with her embrace of women's cultural obligations (Dutta, 2018; Master & Meltzoff, 2020). Ludo's mentee suddenly left, highlighting the importance of intragroup mentoring to STEM women's self-identity to help women navigate the marginalisation and bias (Hunt, 2015; Moss-Racusin et al., 2018). Mmabatho was one of the first-generation women engineers in Botswana. She had a tumultuous journey as a woman in STEM leadership and was able to hold on until she was pushed out towards her retirement (Reilly, Rackley & Awad, 2017).

Sub-theme 6.3: STEM women 's denialism and performative identities

Interestingly, women sometimes minimised their own experiences of marginalisation in STEM and pretended that everything was working out well for them. Almost all the participants tried to give the impression that everything was tolerable. When probed further, they would open up.

The following participant claimed that there were many opportunities for STEM women to get leadership positions, just because they had scholarship opportunities. These were scholarship opportunities specifically for women to pursue post-graduate qualifications but were independent of any opportunities for jobs or progression. In her view, some women deliberately forego promotions:

> *So now I say people that are in STEM, we feel it, because there are already fewer women in STEM. Not that in terms of growth, or anything. In Botswana, opportunities for growth for women in STEM are more… you know the other thing is, this person that I'm talking about is ok. She has just decided that she does not like management positions because of the stress associated with it.*
>
> *Lorato*

Following the interview with Lorato, I decided to interview the friend she gave as an example to test her claims:

> *I think when I applied for this job, I was not smart enough in the sense that I applied for a position which I felt like I was safe. You see where there is this researcher position, I know I qualify. With that senior researcher position, applying would just be trying my luck, wondering if I would get it. So, I was afraid to take that risk.*
>
> *Bonolo*

This participant was sceptical of some STEM women who claimed that the STEM environment was not as negative for women as she experienced it:

> *So, some of my fellow women who are in STEM claiming otherwise, you know, I don't believe them. It is a man's club unless you are in your own organisation. I mean, those who are saying that you know in Botswana nothing like that is happening. I must have been living in a different world because mine was not a joke. I was like it is a glass ceiling, that glass ceiling was you will remain at your*

management level as a manager no matter what. This is what I had to fight because I was long overdue for promotion to the position of Director.

Mmabatho

Some women do not readily admit to experiences of marginalisation for fear of sounding whiny and weak (Martin & Phillips, 2017; Diehl & Dzubinski, 2023). Unfortunately, as Bagilhole, Dainty and Powell (2008) assert, the danger with the denial of gender discrimination is that it perpetuates it. Lorato claimed that Botswana STEM women did not find it difficult to progress. When probed further, she clarified that she was equating scholarships for STEM women to progression, an assumption which was debunked by Magdalene's experience. Magdalene resigned from her job as telecommunications engineer to further her studies. After she came back, she struggled to get a job in telecommunications engineering until she eventually gave up and joined the banking sector. Martin and Phillips (2017) argue that gender blindness grants women protection from self-consciousness. The downside of that, however, is that women risk acceptance of and assimilation into the dominant culture, reflected in Bonolo's self-handicapping.

5.7 Research objective 4

Identify strategies for gender transformation in Botswana STEM leadership

Based on their lived experiences, the participants shared strategies they believed would help facilitate the achievement of gender transformation in STEM. The recommended strategies are for implementation at the personal, organisational, and national levels.

Women's assertiveness and resilience

Some of the participants shared experiences of meltdowns due to gender discrimination. A few of them managed to hold out against pressure while others caved in and quit the STEM profession. It was therefore recommended for women to be taught how to be assertive, a skill often associated with men (Sabharwal, 2015; Johnson, Widnall & Benya, 2018). Women in STEM should be assertive and stand their ground:

I think even our kids, we should learn to talk about their careers, while they are still at primary school, explain how things will be in university. If they come home complaining about a bully, tell her, my daughter you must learn to deal with bullies because they will be everywhere in your life. That is what I chat with my daughter

about. I tell her bullies are even there in the office. "I tell her they will always pull you down, and whenever you try to suggest something then they shoot it down.

Bonolo

Your posture must also show that this is a serious woman. Stop them on their tracks and tell them you must never do that to me…I deserve to talk as much as you do. Maybe I deserve to talk more! Because I normally bring in a lot of points… You must cut them to size. Otherwise, men are just difficult. And then they start calling you aggressive and tell them "Because you don't give me the chance. Also, it is not aggressive I am assertive. Don't confuse the two."

Nchidzi

Gender-neutral child upbringing

Child upbringing came up in almost all the interviews. The participants strongly felt that the upbringing of children was commonly gendered. Boys were raised to be leaders while girls were raised to be caregivers (Koketso, 2015; Swafford & Anderson, 2020). The recommendation was therefore to change that mindset to raise children as equals, with similar roles and responsibilities:

I have a girl and a boy and at his age, he should start helping his sister with the dishes, so it should not be about the girl doing the dishes. So, I think the way we raise our children nowadays must be different. Because otherwise the boy will grow up knowing that house chores are not meant for him, that his responsibilities are the serious and more important ones.

Bonolo

We need to teach our boy children. I think we have neglected to teach them the right attitudes and the right confidence in themselves as men that they don't need a woman to be submissive for them to be showing their intelligence.

Dolly

Build partnerships and collaborations

The strength of teams over individuals was highlighted as a strategy that women could use (Bryson, Crosby & Stone, 2015). These partnerships could be used to mobilise government funding and projects:

We don't necessarily have to grow, but we have a lot of partnerships and collaborations and all that, so we can form teams in any shape or form with different partners.

Ouna

Demand leadership spaces

Agitating for women's inclusion was also flagged as a strategy which women could use to demand meaningful participation in STEM leadership. Compared to the older participants, the younger women were more vocal (Waylen, 2014; Ahuja & Weatherall, 2022; Best, Clark & Picton, 2023):

We need to sort of like demand space, take space and occupy it. For us to be able to do that we need to be given an opportunity to do it.

Pinky

Deliberate policies and processes to ensure appointment of deserving women

Policies to drive structured and organised systems of elevating deserving women should be established (Diop, Coll-Seck & Duarte, 2016; O'Connell & McKinnon, 2021). Although some participants acknowledged efforts made by some organisations to elevate women, the challenge seemed to be the lack of structures to ensure continuity. In the past four years government appointed more women than men into positions of leadership in state-owned entities in general, seemingly rendering this recommendation irrelevant. Unfortunately, the absence of an elaborate policy and implementation strategy makes its sustainability uncertain:

Let us be bold about it and be deliberate and appoint women, not because of their gender but because they have got the capability. We have brilliant women, very good! much better than men, I think government needs to start reviewing policies to see if they are aligned. Right now I cannot even tell you about any one national gender transformation policy.

Pinky

Intragroup career guidance

One of the strategies shared was giving young women the opportunity to see their potential to make it to STEM leadership through women who had done it (Marx & Ko, 2012; Herrmann et al., 2016). Intragroup role models are more powerful than intergroup ones because seeing men

in that role is to be expected, more so for women like Lorato who feared unknown future work-life challenges (Goldin, 2014; Diekman et al., 2017):

> *I wanted us to attend career fairs, talk to students because that is where it all starts. As a girl child when you think about the future, you do not see yourself getting into things construction related. But then when you engage with other women who are doing something different it gives you ideas of what it is that you can do, especially from that age. The first thing is to get more women interested in the profession.*
>
> Pinky

The following strategy would help young girls appreciate STEM professions as they would not only be told about it, but get to experience it:

> *I want to do the take a girl child to work day. Right now, as <name of association> we invited a lot of people to participate in that. But I feel only a few people can participate. So, when you have such a movement, that is so huge, it will even provoke office of the President.*
>
> Boleng

Networking

The participants highlighted the benefits of networking through organised structures such as associations (Casad et al., 2021; O'Connell & McKinnon, 2021). They shared their experiences of support from not only women leaders but also men leaders they interacted with in their organised groups, who behaved more as allies:

> *People who are in associations, I can say they are more liberated, because you would see the women being presidents of <name of national structure> or CEO of <name of national association>. And the engagements I have had with them, I think the male engineers in the associations are more liberated than those who are not. They get so excited, when they see us women doing more because when I left that 3 years challenging job, my next employer I met him in one of these associations. He wasn't fazed by the fact that I am a woman and he is taking me to site. He was like "you are young, you are a woman, and you are doing great!*
>
> Tapiwa

The benefits of networking were also evident in the way participants who belonged to some organised structures were more open to participating in the study as opposed to those that were not affiliated (Robnett, 2015; O'Connell & McKinnon, 2021).

Leadership training

Having people skills in STEM leadership was recommended as that would help leaders, mostly male, understand the needs of women in STEM and foster conducive work environments:

> *Small things are very important so that when you are now holding leadership positions you do not just behave like a technical person who only works with equipment. You must learn these things, whether it is an HR certificate or something, social skills are very important in such positions. You can learn a lot from the challenges you are experiencing and come up with solutions to them.*
>
> Boitumelo

Intergroup engagements

Some participants recognised efforts made by some of the men they associated with at work or in professional associations who were supportive and encouraging of the women (O'Connell & McKinnon, 2021; Kim & Meister, 2022). It was, however, clear that the mindset change flowed from extensive engagements with women where these men eventually mentally closed the gap between men's and women's capabilities. Intergroup engagements were therefore recommended as a bridge-building tool:

> *Through staff meetings, we shared our concerns as women…even though we were not seeing the results immediately, but we were persistent in addressing the issues, and maybe that is why they ended up recognising that there were women in their midst. It is always difficult when you are newly entering but eventually, they get used to it.*
>
> Boitumelo

Gender neutral curriculum

At a young age, students are highly impressionable. They believe everything they are taught at school and that can shape the rest of their lives. Some of the topics taught in basic education, though noble, were found to be perpetuating the marginalisation of STEM women by teaching girls their "place" in society at an early age (Koketso, 2015):

There is this subject I dislike that my child is doing called cultural studies. It still has that narrative, they are still preaching that "mommy cooks, daddy buys food," and I constantly have to correct my child that "I am not daddy. I am mommy and I am buying food."

Kate

Supportive work-life balance statutes

One of the greatest challenges to the participants was unsupportive work environments (Xu, 2015; Asghar, Gull, Bashir, & Akbar 2018). While the existence of WLB policies was acknowledged, there were concerns about some of the policies that were considered punitive towards women based on the number of pregnancies:

The laws must change. I think <name of organisation> now as they are reviewing the act, they need to know that there is a time when women have to go on maternity leave, and their remuneration should not change. Not this thing of half salary because it affects your career. It affects you even financially because at the end of the day, you had been delivering, and even when you finish, you are still going to perform…We should recognize that there will be a time when we will be working from home, or we will be working less hours. We should not be perceived as not performing.

Kelly

The provision of childcare facilities in the workplace was also proposed:

If workplaces could also embrace such, to have nurseries or just to have advocacy for assisting mothers. We know that some parents during lunch hour they have to dash to get their kids and sometimes your child is based the other side of town, and you live a different direction from work, so you have to drop the child because you cannot bring the child to work for the afternoon, so if workplaces could have play areas.

Bonolo

Quotas

The participants were mostly against the allocation of quotas as they strongly believed that women were capable of successfully competing for positions in STEM leadership at all levels. They however conceded that quotas would be a valuable strategy if implemented correctly

(Diop, Coll-Seck & Duarte, 2016; Axelsdóttir, Einarsdóttir & Rafnsdóttir, 2023), such that it protected women beneficiaries from being ridiculed for being nothing but affirmative action promotions (Ncube, 2018):

> *You have to have criteria because we do not just want someone appointed because she is a woman. So, we are saying, let us get women, but on merit. But this one of quotas where you lump everybody there, I do not think it is fair. Personally, I believe that even though there is this quota, there should be some criteria requirements. We have to have some laid down standards.*
>
> Ouna

> *Some have suggested having quotas on projects such that as a team you need to have at least this many women. But I feel like those ones sometimes people then feel like you only made it because of the quota. You are only here because of the 5% women requirement so, you are not even qualified, you are not even capable of doing this. So that one of quotas I am not too keen on it.*
>
> Tapiwa

Women empowerment

There seems to be a general misconception that Botswana is a matriarchy. Botswana is a patriarchy with a twist (UNDP, 2012; Moswete & Lacey, 2015). Batswana women have had to learn to be independent due to the prevalence of woman-led households (Moswete & Lacey, 2015). Women still need to be empowered to stand up for themselves. It was evident that women who reported to be part of some professional societies felt more empowered and vocal than those who were not:

> *I think women in Botswana are empowered by the fact that mostly, Botswana is one country where you find a lot of single parenthood, so we grew up knowing that women are strong. Women are often self-reliant and independent. We know how to lead from behind. But it is not like there is any deliberate effort to empower women because at the end of the day, the society is still patriarchal. That useless husband will still be the one who decides how the money I make is spent, even if he is not working.*
>
> Bonolo

Appointment of STEM women influencers and mentors

Strengths men were said to have over women were their brotherhood and their ability to hold meaningful interactions across generations. It was therefore highly recommended for women to open up and reach out to other women to guide and motivate them on how to become successful in STEM employment (Holder, Jackson & Ponterotto, 2015; Corneille et al., 2019). Women in STEM were mostly reported to be struggling with self-doubt due to the continued pressure of discrimination. Mentorship from other women would help them build confidence (Latu Mast, Lammers, and Bombari, 2013; Ahuja & Weatherall, 2022):

> *Yes, I have talked about awarding some position of power to experienced STEM women. Recognize them, and then others will follow, even the upcoming ones, because STEM equality is about that girl child.*
>
> Kelly

Retired women STEM leaders were proposed as possible role models:

> *I don't see projects coming from retired women in STEM, like what are they doing? That's like a lost resource. So those are some of the things I always want to bring up and find out what's happening with the retired female engineers, you know? And what could we provide for them?*
>
> Boleng

5.8 Research Objective 5

Develop a conceptual framework for gender transformation in STEM leadership

The last objective of the study was to develop a conceptual framework for gender transformation in STEM leadership in Botswana. Svinicki (2010, p5) defines a conceptual framework as a collection of linked ideas explaining how a particular phenomenon occurs. The conceptual framework derived from the findings is shown in Figure 6.1. It depicts the interconnectedness of the social identities in the intersections and their resultant gendered experiences and consequences, as well as the strategies to be used towards gender transformation.

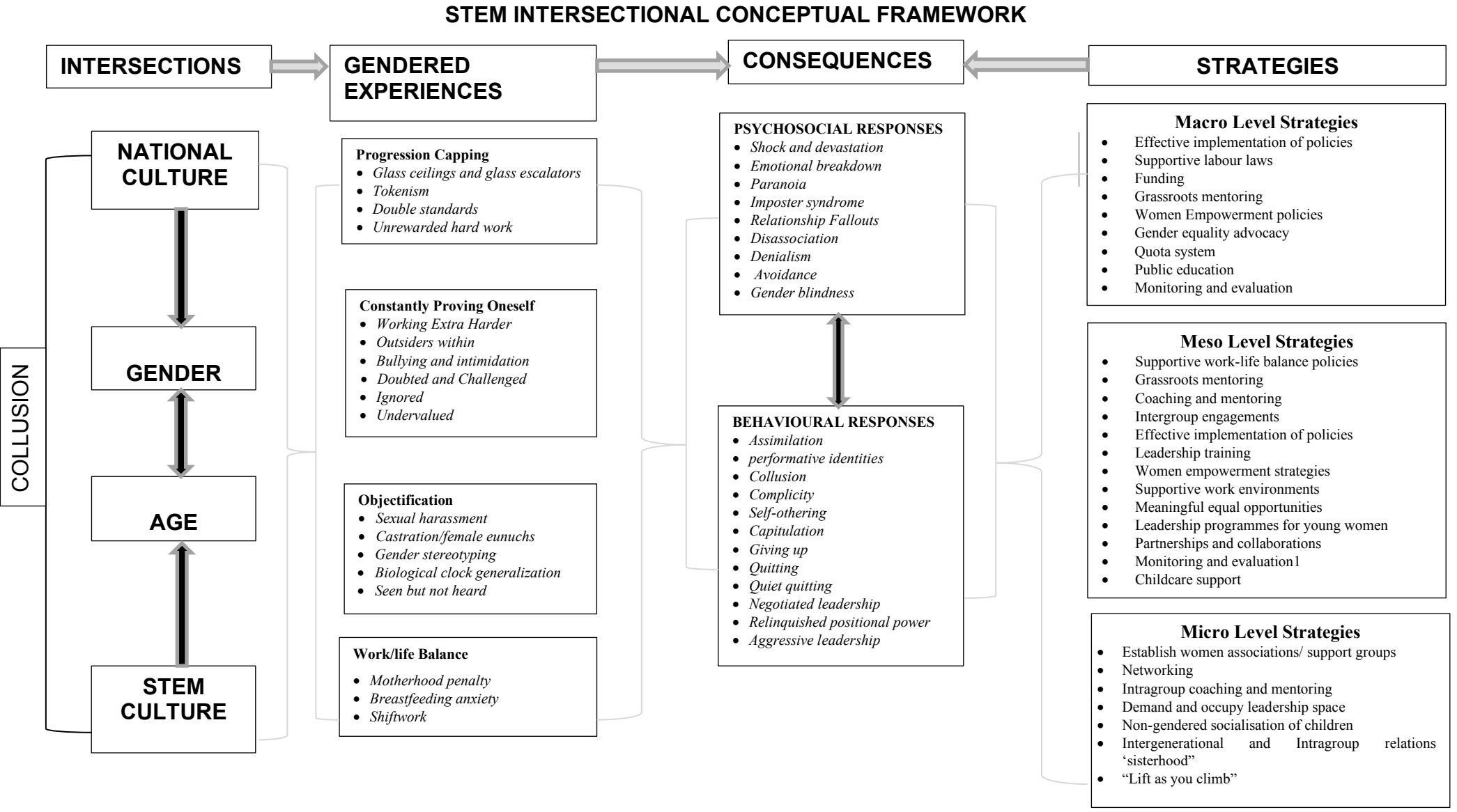

Figure 5. 1: Conceptual framework

Figure 5.1 above is the Conceptual Framework. The conceptual framework presents the intersections, gendered experiences, and consequences. It then sets out the gender transformation strategies proposed by the participants according to the micro, meso, and macro levels of implementation. The intersections reflect the collusion between national culture and STEM culture, as they have proven to be inseparable in their effect on the participants' lives, as well as their intersections with gender and age. The intersecting identities then link to the gendered experiences which are grouped according to the data as detailed under objectives 1 to 3, as discussed earlier in the chapter. The gendered experiences are centred on progression capping, women's constant need to prove themselves, the objectification of women, and their work-life balance challenges. The gendered experiences then manifest in different psychological and behavioural responses as the women struggle to find themselves in the field. The consequences were discussed under objectives 1 to 3.

Lastly, the conceptual framework presents the strategies that can be implemented at three levels, namely the micro (personal), meso (organisational) and macro (societal and national) levels. Micro level strategies are implemented at both one-on-one and group levels to multiply and amplify the effectiveness of the strategies. Although micro strategies require implementation at a personal level, they flow into group level implementation through interpersonal structures such as family. The meso level strategies are to be implemented at organisational levels by STEM companies and organisations to influence gender transformation in the workplace. These strategies are to target policy development and implementation to protect and benefit women across different ages and levels of responsibility. These strategies are expected to be implemented by employees across genders, hence the need for leadership training for both men and women. While the training of women should focus on preparing them for leadership opportunities, the training of men, who hold most of the leadership positions, is important in fostering a conducive environment for women in STEM. Macro level strategies focus on the development and implementation of national laws and policies to influence structural, institutional, and systemic practices. These strategies are expected to involve different systems, including education and employment. Effective implementation, monitoring and evaluation of the strategies are critical to the effectiveness of the conceptual framework. When implemented correctly, the conceptual framework is expected to positively influence the gender transformation process in the STEM sector and normalise female leadership in STEM.

CONCLUSION

This chapter presented and discussed the key findings of the study. Each objective was discussed according to the themes and sub-themes that emerged from the data analysis. The chapter further explored the strategies proposed by the participants for gender transformation in STEM leadership. The last objective of the study, which required the development of a conceptual framework to be used to address the objectives of the research, was met. The next chapter presents conclusions and recommendations of the study.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

The purpose of the study was to explore the intersection of gender, culture, and age in the experiences of current and former women STEM leaders, and the contribution of STEM industry dynamics. The use of intersectionality as a key conceptual framework was meant to shed light on the persistent domination of STEM leadership positions by men. The study also sought to contribute to the growing intersectional leadership research in STEM and on the African continent. This chapter presents the conclusions of the study in relation to the purpose of the study. It first addresses the findings of the study, outlining the contribution of the study, and then covers the limitations of the study and suggestions for future research. The chapter concludes with my final thoughts and reflections on the research journey.

The study was interpretivist as it depended on meanings from participants' viewpoints on the phenomena being researched. It assumed that data were both culturally and socially constructed and thus recognised the peculiarity of each participant's lived experiences. As a result, the findings of this study may not be generalisable, but can be transferred to other similar situations. The study used qualitative research and constructivist grounded theory in particular, to develop a theoretical framework through a rigorous process of systematically collecting and analysing data. Semi-structured interviews were conducted to collect data, relying on the open-ended interview questions to solicit rich thick data from the participants.

Overall, the study found that the intersection of gender and culture was a constant factor in the lived experiences of women in the Botswana STEM leadership. Although the study set off to investigate the influence of industry dynamics on the women's experiences, it instead revealed the perennial link between the masculine STEM culture and the patriarchal national culture. While age was also a marginalising identity for women, it was more problematic for younger and older women. Middle-aged women were shielded by the illusion of equality, as progression seemed relatively accessible only up to middle management.

Although there were instances of gender transformation strategies in place, their inefficiencies and

failures were highlighted by the participants. The participants therefore proposed gender transformation strategies to be implemented at the micro, meso and macro levels. This chapter outlines the contribution of the study, limitations of the study, suggestions for future research and strategies for gender transformation in STEM leadership as an offering of the study, both theoretically and practically.

6.2 CONTRIBUTION OF THE STUDY

This study makes a significant contribution to the body of knowledge on intersectional leadership research in Botswana and Africa, reducing the heavy reliance on studies from the global North. It provides a contextual understanding of the women's marginalised leadership experiences in STEM. The study also makes an important contribution to gender transformation practice in the Botswana STEM sector.

6.2.1 Theoretical contributions

There is a paucity of empirical research on women's lived experiences of marginalisation in both the Botswana and Africa STEM sector. Empirical research using intersectionality in the study of women's leadership experiences in Botswana is still in its embryonic stage. That makes this study a significant contribution to theory development. The combination of qualitative research and intersectionality enabled the study to access rich data giving vivid insights into women's navigation of the STEM sector while burdened by their age, gender, national culture, and industry culture. It is hoped that the study will promote the use of intersectionality in the research of the lived experiences of women in Botswana, both professionally and socially. The inclusion of age also brings in a new perspective as its simultaneity with gender and culture in the lives of women STEM leaders has not been adequately researched, if at all.

The findings of the study led to the development of a conceptual framework to influence meaningful gender transformation in the Botswana STEM sector at national, organisational, and individual levels. Thus, the main theoretical contribution of this study is the intersectional conceptual framework presented in Figure 5.1. The framework offers a holistic view of gender issues in the STEM sector in Botswana. No other intersectional conceptual framework focusing on STEM leadership was located. The framework illustrates ways in which women's social

identities intersect, resulting in women's gendered experiences and their consequences, and proposes gender transformation strategies.

6.2.2 Practical contributions

The findings of the study have the potential to improve gender transformation practice at the individual, organisational, societal and policy levels.

6.2.2.1 Contribution to individual practices

The conceptual framework shares strategies that can influence individual behaviour and practices based on proposals from the participants. While some of the micro level strategies require implementation at one-on-one or personal level, others require collective implementation at societal level. gender equality advocacy.

6.2.2.2 Contribution to organisational policy and practice

The conceptual framework provides direction to organisations in the development and implementation of effective gender inclusion policies. The individual level strategies in the conceptual framework will influence individuals positively and contribute to the development of a conducive STEM culture and environment. The group level strategies in the conceptual framework will encourage public discourse on the normalisation of women in STEM leadership. Effective application of the recommendations in the conceptual framework will therefore result in fewer women exiting the STEM professions and increase access to leadership positions for women.

6.2.2.3 Contribution to government policy and national practice

Although Botswana has demonstrated willingness to promote gender equality for women in STEM, inadequacies in policy development and implementation have resulted in minimal progress. The conceptual framework therefore provides research-based guidance to the development of effective national gender equality statutes, policies, and strategies.

Based on the strategies recommended in the conceptual framework, four key role players were identified as critical to the STEM gender transformation process, namely, policymakers, educators,

STEM industry employers, and STEM industry leaders. Specific actionable strategies were therefore further recommended for implementation by the different role players.

Development, as well as adequate monitoring and evaluation of some important policies is recommended for specific implementation by Government Policymakers:

- Supportive labour laws
- Gender equality laws
- Comprehensive Quota policy
- Policy to drive public education on gender equality
- Supportive work-life balance policy
- Coaching and mentoring policy
- Women empowerment policy
- Policy on leadership programmes for young women

The following recommendations are made for implementation by Educators:

- Coaching and mentoring
- Non-gendered curriculum
- Establish networking groups for women and girls
- Intragroup coaching and mentoring
- Intergroup engagements on gender issues
- Leadership training for women and girls
- Effective implementation of policies

The following recommendations are made for implementation by STEM Industry Employers:

- Coaching and mentoring policy
- Supportive work-life balance policies
- Coaching and mentoring
- Intergroup engagements on gender issues
- Leadership training for women including young women
- Adequate consultation on women's issues

- Supportive work environments
- Meaningful equal opportunities
- Women empowerment strategies
- Comprehensive Quota policy
- Partnerships and collaborations with Educators
- Effective implementation of policies

The following recommendations are made for implementation by Industry leaders:

- Establish women associations/ support groups
- Networking
- Intragroup coaching and mentoring
- Intergenerational and Intragroup relations 'sisterhood"
- Grassroots mentoring
- Leadership training
- Partnerships and collaborations with educators and employers
- Gender equality advocacy

6.3 LIMITATIONS OF THE STUDY

This is a qualitative study that applied the constructivist principles of constructivist grounded theory to a sample. It is, however, important to seek understanding of men's views on the same phenomenon in future. Other social identities, such as class, were not included in the study, which would have improved the transferability of the findings of the study. Another limitation was that the study only comprised one-on-one interviews and did not use a focus group for data triangulation. The conversational nature of focus group discussions would have presented the opportunity to further flesh out the themes from multiple vantage points. The nature of the study – being a doctoral thesis – limited the study to being cross-sectional. A longitudinal study would have the benefit of capturing the women's experiences over an extended period. Some of the participants shared some negative experiences in their educational journey in STEM. The negative experiences were not prohibitive enough to discourage the participants from joining STEM professions. It is however important to establish their impact by researching young women's intersectional experiences in STEM education. Such research would inform some of the strategies

proposed in the conceptual framework above, as well as the cultural repositioning process.

Although the study included participants from four towns instead of the intended two, the towns were in the central and southern parts of Botswana. Stakeholders in the northern part of the country were excluded. However, the study should create an ongoing dialogue, resulting in more studies exploring other social identities as well as addressing the limitations of this study, thus exploring more challenges experienced by women in STEM leadership. Future research must target the other regions of the country not covered by this study in case to capture variations in national culture.

Equally significant was the challenge of "the dark side of truth(s)" (Clark & Sharf, 2007) resulting from the small size of the STEM sector in Botswana, where everyone knows everyone else and their story. That is due to the small population of Botswana. I grappled with the narration of some of the participants' lived experiences, as the few women in leadership had the potential of being known and their stories easily recognised. I therefore applied ethical requirements (Creswell, 2009; Creswell & Poth, 2018) to make the data less identifiable, while preserving its richness and meaning.

The use of a binary definition of gender is a heteronormative blind spot that future researchers should attend to. With Botswana's recent legal recognition of the LGBTQIA+ community, it is important that STEM women's true identities are recognised and understood, both as individuals and as communities. Future research must therefore study intersectional experiences of STEM women who identify as LGBTQIA+. Heterosexual gender researchers who identify as feminists like myself need to be alive to their blind spots.

Lastly, most of the interviews were conducted virtually because of the Covid-19 era uncertainties where physical contact was discouraged. Virtual interviews took away the advantage of body language and rapport building. That was however a great opportunity to reduce costs of time and finances. It is therefore something that future research should consider taking advantage even if it may be to a lesser extent.

6.4 SUGGESTIONS FOR FUTURE RESEARCH

To expand on current knowledge and understanding of women's intersectional experiences in STEM leadership, more research needs to be done – one study alone could not suffice to unravel the complex nature of the phenomenon. It is therefore suggested that future studies should consider the following areas which came up in the study as important topics in their own right:

- The intersection of social class with gender and age in women's experiences in STEM. It is important to understand how women from different social classes are affected by their subordination.
- A longitudinal study.
- The impact of work-life balance issues on STEM women leaders' experiences.
- How sexual harassment in the STEM sector affects women. This did come up in the study as a major concern for younger women, and yet a non-issue for older women.
- Implications of digitisation for gender transformation in the STEM sector. Some of the marginalisation of the women was based on their supposed inadequate physical strength, even in instances where physical strength was not required.
- In terms of conceptualisation, this study used the binary notion of gender, which is problematised by current discourse. It would therefore be beneficial for future studies to broaden their definition of gender.
- This study was conducted in only two regions of Botswana. Future researchers should interview participants in all four regions of the country to make the findings more representative.

6.5 CONCLUSION

Development should be about more than just skyscrapers and fast cars and include the equal development of human beings, both male and female. It should be about equal access to education for boys and girls, as well as equal employment and progression opportunities for women and men (Parpart, Connelly & Barriteau, 2000). If women are good enough to perform well in STEM subjects, they should be good enough to hold leadership positions in the STEM employment sector.

The study was able to address the research questions and objectives and stands to make an important contribution to gender inclusion in the Botswana STEM sector. It was a challenge to

convince the participants to participate in the study. However, by the end of the interviews they were all grateful for the opportunity to revisit their buried uncomfortable experiences. They all emphasised the importance of intersectional research in the quest for gender equality in the STEM sector. Each of the participants had unique experiences to share, yet all depicted the non-linearity and complexity of women's intersectionality and marginalisation.

6.6 FINAL THOUGHTS AND REFLECTIONS

Conducting this research was a rollercoaster journey with beautiful highs and fearful lows of uncertainty. Despite the occasional self-questioning of what I had got myself into, that strong STEM woman personality I saw in most of my women participants stood firmer. Some days I would feel on top of the world and in control and other days I would feel so depressed I would not want to get out of bed. But through it all, quitting was never an option. The interviews' concluding discussions where the participants expressed gratitude for the opportunity to travel back on their life experiences made me realise why this study was close to my heart. Since I left STEM, I had never allowed myself time for full retrospection of my STEM journey to face my discomforting experiences. I am therefore grateful to the research journey for having unintentionally offered me that opportunity.

I must also acknowledge the gruelling yet fulfilling nature of constructivist grounded theory as a research method. The self-transcription coupled with the iterative nature of the data analysis process was the most exhausting, but very necessary, part of the of the process as a way of self-immersion in the study. The benefits did outweigh the pain as it helped me to become intimately familiar with my findings and facilitated the subsequent synthesis of the findings and literature.

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Appendix 1: Interview Schedule

- Thank you for agreeing to avail yourself to participate in my study. This study seeks to build on the emerging body of intersectional leadership research in Africa, and STEM leadership in particular. Specifically, the study explores the intersection of gender, culture, age, and STEM industry dynamics on the other hand, through the eyes of women in STEM leadership, and that is where you come in. The study seeks to understand the experiences of women STEM leaders in Botswana, and how these are impacted by their gender, culture, and age, as well as industry dynamics. The findings of the research will contribute to the development of mitigation strategies towards improving the quality of experiences of women STEM leaders. Research findings stand to inform organisational practices towards meaningful gender transformation in the STEM field. Let me remind you that you are free to withdraw from the interview anytime should you no longer wish to continue. You are also free to skip any questions you are not comfortable responding to.

***Intersection of gender, culture, and age*:**

- To start the interview, can you tell me about the position you currently hold. the sector? What it involved and how long you have been in it?
- How long have you been working in the STEM sector?
- What have been some of your positive and negative experiences as a leader in the STEM sector?
- To what extent do you think your gender, has impacted your experiences as a leader in the STEM sector?
- What about your age? How has that impacted your experience?
- To what extent do you think the broader societal culture in Botswana has had an impact on your work life and experiences as a leader?

Let us move on to the culture of the STEM sector in Botswana:

Impact of STEM industry culture:

- How would you describe the culture of the STEM sector in Botswana?
- What are some of the positives and negatives about the sector? Do you have any personal experiences you would like to share? (Probe)
- How receptive do you consider the STEM industry culture to be towards women in general? Would you like to share any personal negative and/or positive experiences?
- How easy is it for women to ascend to leadership positions within the STEM sector in Botswana?
- What about men? How easy is it for men to ascend to leadership positions within the STEM Sector?
- What are your thoughts on the fact that many women leave the STEM sector to join unrelated sectors? What do you think are the reasons behind them exiting the sector?
- To what extent has the culture of the STEM sector impacted your experiences as a leader?

-
- Is there anything you would like to add before we move to a different set of questions?
-
- ***Continued male dominance in the Botswana STEM leadership:***
-
  - Thinking about gender representability at leadership levels, how well do you think the STEM sector in Botswana is doing? How does the representation of men and women compare?

- (If the answer suggests male dominance ask) In your view, what contributes to the continuing male dominance in STEM leadership? What are some of the reasons that women continue to be under represented at senior levels?
- Is there anything women are doing to contribute to their exclusion from leadership positions in the sector? *(Probe)*

Strategies for gender transformation in STEM leadership:

Let us now talk about the strategies for gender transformation.

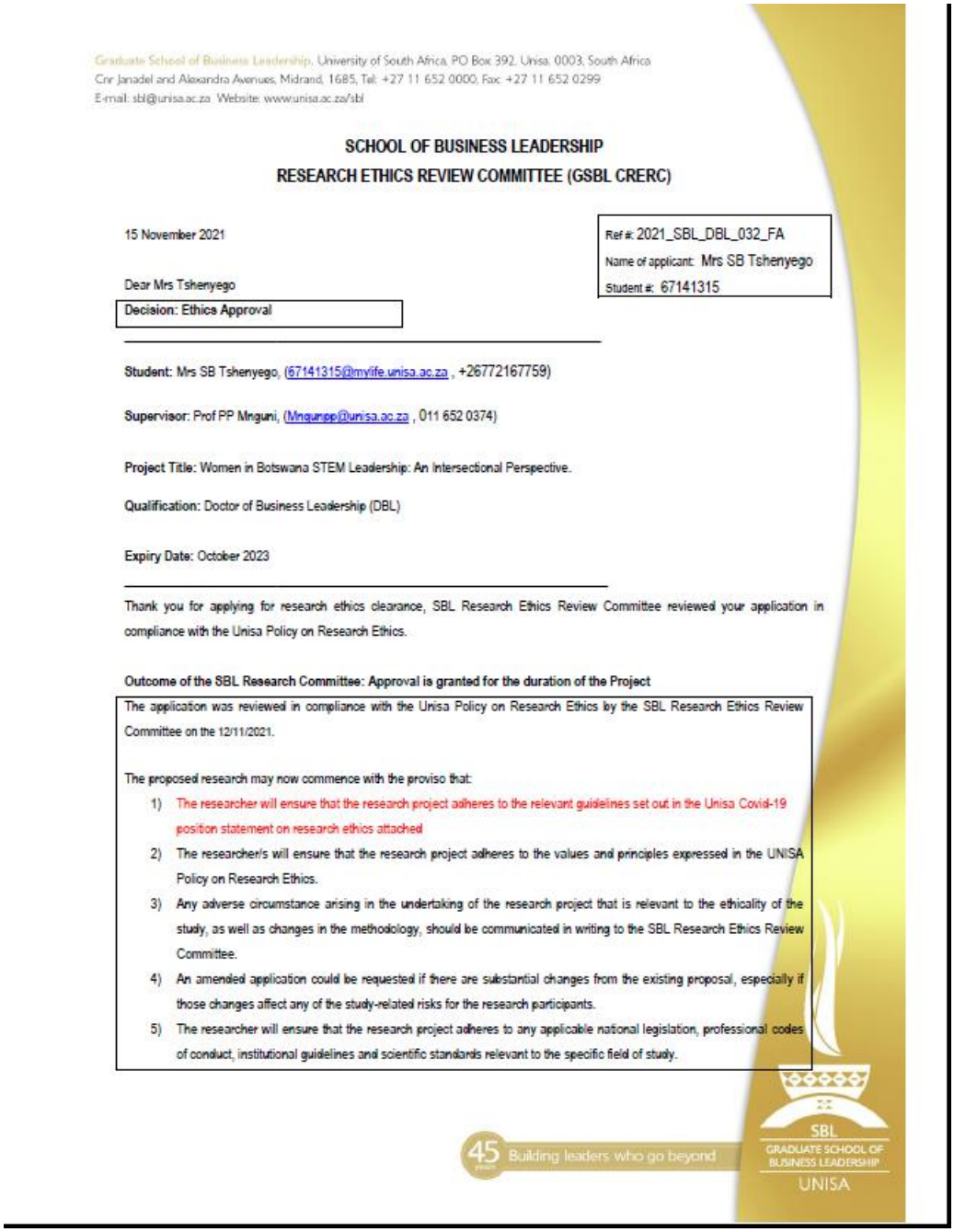
- What are some of the things that need to change to ensure women are fairly represented in leadership positions in the STEM sector? (*Probe*)
- What strategies do you think are needed to ensure STEM women graduates enter the sector?
- What about strategies to prevent women exiting the sector?
- What strategies and interventions do you think are needed to ensure women do ascend to leadership positions in the STEM sector?
- What about at policy level? What can government do to facilitate gender transformation in STEM leadership?

We have come to the end of our interview. Is there anything you would like to add before we close the interview?
Are there any questions you would like to ask?

Thank you for making time to participate in this research and sharing your experiences. I would like to reassure you that your identity will be kept anonymous and confidential.
Would you like me to email you the transcribed interview so you can satisfy yourself that your responses are accurately captured?

Once again, thank you for your time and valuable insights.

Appendix 2: Ethics Clearance Certificate



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SCHOOL OF BUSINESS LEADERSHIP

RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

15 November 2021

Ref #: 2021_SBL_DBL_032_FA
Name of applicant: Mrs SB Tshenyego
Student #: 67141315

Dear Mrs Tshenyego

Decision: Ethics Approval

Student: Mrs SB Tshenyego, (67141315@mylife.unisa.ac.za , +26772167759)

Supervisor: Prof PP Mnguni, (Mngunpp@unisa.ac.za , 011 652 0374)

Project Title: Women in Botswana STEM Leadership: An Intersectional Perspective.

Qualification: Doctor of Business Leadership (DBL)

Expiry Date: October 2023

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

Outcome of the SBL Research Committee: Approval is granted for the duration of the Project

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 12/11/2021.

The proposed research may now commence with the proviso that:

1) The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached
2) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.
4) An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.
5) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

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Kind regards,

NBWMlitwa

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