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Bicultural Life Experiences and Career Orientation of South African Indian Women Engineers

By

Vanishree Nundagopaul Pillay

A thesis submitted to the Faculty of Commerce, Law and Management,
University of the Witwatersrand, Johannesburg,
in fulfilment of the requirements for the degree of Doctor of Philosophy.

October 2021

DECLARATION

This serves to confirm that the thesis presented is my original work and has not been presented for a degree in any other university.



……..……. 5th October 2021

Vanishree Nundagopaul Pillay **Date:**

DEDICATION

"*Thayir sirantha koyilum illai thanthaisoll mikka manthiramillai*"

Translated:

There is no greater temple than one's Mother or a mantram greater than the words of advice spoken by one's Father.

To my Mother, the embodiment of my temple, without you I would have not become the woman that I am today!

To my late Father, your words, "Invest in yourself", became the mantram that carried me through this journey, a journey I started, to find myself when I lost you.

Dedicated to my father, the late Mr Nundagopaul Dan Pillay

Born: 21st August 1948

Called to rest: 30th December 2015

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Firstly, to the 25 phenomenal women who participated in this study: without your stories, this research would not have been possible. Thank you for your bravery and for sharing your life stories with me and with the world.

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Last but **most importantly**, thank you to **My Great Mother Kali**, for giving me the Shakti to take on this journey to completion.

Aum Aim Hreem Kleem Chamuday Vichaye Namaha!



ABSTRACT

The purpose of this research is to explore the bicultural life experiences of South African Indian women engineers and from this, understand how identity experiences in their bicultural context inform their decision to remain in the profession. A review of the relevant literature offered biculturalism within the discourse of Identity Theory, and social cognition stemming from Social Cognitive Career Theory, as the main concepts to guide the trajectory of this investigation. The study is exploratory in nature with a qualitative design. Semi-structured interviews were conducted with 25 South African Indian women engineers from the public and private domains. Non-probability sampling strategy was adopted and effected through a snowballing technique to purposively secure candidates fitting the eligibility criteria. A narrative analysis of the transcripts was executed in a two-step process. First, by means of a three-part approach consisting of personal, social and temporal dimensions; life stories were unearthed from the interview transcripts in a deductive manner and formulated into a narrative. Secondly, narratives were inductively analysed using thematic analysis. Findings indicated that support from family, coupled with the transformed application of an Indian androcentric cultural value system within the home, positively influenced participants' socialisation process. This triggered optimistic social cognition that informed high levels of self-efficacy and progressive decision-making. The limited organisational support reported by participants pointed to ubiquitous gender challenges: these negatively impacted professional opportunities and growth. Also clearly evident were perceptions and bias about women in the profession, strongly premised on gender identity, as opposed to racial identity. Motivation to remain an engineer was predicated on: (a) passion for the discipline; (b) career growth and opportunities; and (c) financial independence/empowerment. The findings, and their implications, offer higher education institutions and engineering bodies a point of departure

that can inform strategies to motivate female engineers to remain in the profession. The study contributes to the evolving body of knowledge on biculturalism through the bicultural life stories presented by a sample of ethnic minority women who are absent from the literature pertaining to biculturalism. The research offers an assimilated version of Lent and Hackett's Social Cognitive Career model, represented in a Bicultural Social Career Trajectory, as an understanding of the interplay between identity tags, context, cognitive processing and action behaviour. The sample's location and nationality impose certain limitations on this study. Participants were South African-born Indian women engineers from three of the country's nine provinces. Hence, the findings cannot be generalised to South African Indian women engineers from the remaining six provinces, nor to foreign nationals of Indian descent. These limitations offer an opportunity for future research on ethnic minority women of Indian descent, regardless of nationality. This would entail an extended geographical reach to include countries that have a population of Indian women engineers. Such a study could potentially unearth interesting nuances regarding the bicultural life experiences and career orientation of Indian women engineers on a global scale.

Keywords: *identity, Indian women, engineering, biculturalism, bicultural stress, self-efficacy, SCCT, social cognition, career-orientation.*

TERMINOLOGIES

STEM	This acronym describes courses and/or careers within the field/s of Science, Technology, Engineering and Mathematics.
Biculturalism	Biculturalism represents comfort and proficiency with both one's heritage culture and the culture of the country or region in which one has settled. It is applicable not only to immigrants, but also to children of immigrants who—although born and raised in the receiving society—are likely deeply embedded in the heritage culture at home with their families (Schwartz and Unger, 2010, p. 26).
Bicultural	A person who is part of two different cultures (West, Zhang, Yampolsky and Sasaki, 2017, p. 964).
Bicultural Identity Integration (BII)	Bicultural understanding of how people's two cultural identities relate (Benet-Martínez and Haritatos, 2005).
Bicultural experience	A bicultural life experience requires that a woman creates a dynamic, fluid life structure shaping the patterns of her social interactions, relationships and mobility, both within and between the two cultural contexts, these being her ethnic context and a White dominant context (Bell, 1990).
Bicultural stress	The stress of having to function in two separate cultural contexts (Bell, 1990).
Indians in South Africa	A population of individuals whose heritage land is India, but through the indentureship of their forefathers, came to be born in South Africa.
Marginality	A *marginal person* is one who lives on the boundaries of two distinct cultures, one being more powerful than the other, but who does not have the ancestry, belief system, or social skills to be fully a member of the dominant cultural group (Bell, 1990, p. 463).
Identity (personal and social)	*Personal identity*, which differentiates the unique self from all other selves, is different from *social identity*, which is the internalisation of often-stereotypical collective identifications (Jenkins, 2014).

Race in South Africa	Under apartheid, people in South Africa were racially classified by their skin colour. Culture and historical systems of oppression warranted entrenched beliefs.
Sex	Sex refers to the biological role of an individual in terms of their associated reproductive function.
Gender	Category assigned to an individual based on the social associations linked to what it means to be male or female.
Culture	Ideas, customs and social behaviour of a specific group of people.
Ideology	Norms and values that become ideas, and ideals governing a community's identity.
Patriarchy	A community that is organised along male-dominated lines.
Double minority	Belonging to two oppressed social categories of identity.
Class	*Class* refers to the economic (including production and distribution) relations of exploitation, power, dominance and subordination that produce inequalities and contradictory interests (Acker, 2000, p. 196).
Ethnicity	Ethnicity is the product of actions undertaken by ethnic groups as they shape and reshape their self-definition and culture; however, ethnicity is also constructed by external social, economic, and political processes and actors as they shape and reshape ethnic categories and definitions (Nagel, 1994, p. 152).
Efficacy expectation	Belief concerning the performance of a behaviour (Hackett and Betz, 1981).
Outcome expectations	Belief concerning the consequences of a behaviour (Hackett and Betz, 1981).

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CHAPTER 1: INTRODUCTION

1.1 Introduction

"*To be in the margin is to be part of the whole but outside the main body*" (Hooks, 1989, p. 20)

Women have historically populated the role of absence (Gordon, 2018, p. 33). This has been a by-product of societal perceptions about a woman's identity and role expectations in relation to her male counterpart. These perceptions—mostly predicated on embedded patriarchal norms and values—advocated the dominance of men over women. A gender-stereotypical view, that women were 'soft' and 'weak' and men were 'tough' and 'strong', informed an oppressive 'altruism' that placed men as women's caregivers and gatekeepers (Qureshi, 2014). For some women, gender was not the only trigger of subjugation. Intersecting identities of race and ethnicity, coupled with their gender, fed into layers of oppression shaped and reshaped by regimes of inequality and dominion.

The interlocking nature of processes of differentiation/social association (*racialisation, ethnicisation, gendering*) within systems of domination (*colonialism, sexism, patriarchy, racism, apartheid)* isolates the experiences of some women as uniquely different to others in their identity of 'otherness' (Hooks, 1989; Acker, 2006; Carrim, 2016). It is these very systems and processes within which women are socialised, in terms of their role and expectations as defined by the community for their social space. In the case of ethnic minority women or ethnic majority women, this social space is most often governed by a tight, collectivistic cultural system, which informs

norms and values—patriarchal in nature—that perpetuate the oppression women experience at a much deeper level (Barnes, 2017).

The result of this 'way of life' fed into role definitions that were androcentric in nature and led to the division of labour, not only in the home in terms of the financial power of men and the domestic subservience of women, but carved out the slanted nature of society's workforce. This societal workforce boasted a strong and full presence of men in positions of power in contrast to a limited, selective, controlled representation of women in low-key positions, and in some cases, no representation at all. This disproportion was the very gap that would inform the future challenges around meaningful inclusivity of women in the workplace (Acker, 1990).

With the advent of globalisation came the inclusion of women into the workplace. This radical shift offered much to women in terms of agency and opportunities that followed, promising economic empowerment and financial freedom. The reality of this shift overcame the "first nail knocked into the coffin" epithet covering archaic ideologies of patriarchy feeding into societal perceptions of, and discrimination against, women. Perhaps the most significant change came with the presence of women in STEM-related (Science, Technology, Engineering and Mathematics) degrees and careers, a space previously deemed to be reserved for males. However, historic as this change was for women and the world, challenges stemming from patriarchy prevails, especially for those women whose historic backgrounds involved systems of oppression and subjugation (King Miller, 2017). Entering a space that was previously taboo, such a woman must now find ways of interpreting, integrating and negotiating her multiple identities within two

different cultural contexts—her personal and her professional contexts—and in doing so, her 'new' identity as a bicultural is born.

Bicultural people, or people who are part of two cultures, represent a growing population in the world (West et al., 2017, p. 964). To understand their life experiences requires a deeper understanding of their identities (social tags) in relation to space, continuity and interaction, all of which informs an experience (Clandinin and Connelly, 2006). Hence, identity cannot be understood as a simple stand-alone, but as interlinked fluid versions of self that is formed and functions within systems/structures of oppression (Hooks, 1989; Bell, 1990). The importance of having an appreciation for an intersectional approach is paramount if the uniqueness of an experience is to be understood. This approach is premised on the understanding that deeper inspection of identity had to be done by using not just a single-axis approach, but also one demanding an intersection of all axes, in this way not subordinating one identity at the expense of another (Crenshaw, 1991).

Without subordinating the importance of an intersectional approach, there must be appreciation that, to understand bicultural life experiences, identities of intersection must be understood, but in concert with the contextual factors. Contextual factors are the arms that act as either support or barriers, triggering specific social cognitive processes to inform choice that eventually articulates into decision (Lent, Hackett and Brown, 2008; Lent, 2013). The conceptual framework for this study is informed by the integration of Biculturalism and Social Cognitive Career Theory (SCCT), from which major concepts are drawn to facilitate a working conceptual mechanism.

This integration will guide the conceptualisation of career development from the perspective of a bicultural woman. Use of an intersectional lens of investigation enables identities in relation to contextual factors (in their capacity as support and barriers) to be explored, establishing how this relationship triggers stages of social cognitive processing and its influence on the choice to remain career-orientated. A qualitative methodological approach is adopted through the use of semi-structured interviews. As a result, life stories can be extrapolated – life stories, which the researcher envisages, will articulate the effect of the intersectional identities of South African Indian women engineers in their bicultural space and, how these identities either support or hinder career orientation.

To better understand the South African Indian woman engineer, some context—in the form of a brief history of South Africa, as well as the engineering industry in South Africa, and how Indian women featured over time—is vital. This will be followed by the identified gaps in the literature, the stated research problem that gives rise to the purpose of the study, and through the study, what the researcher envisages as possible research contributions. Finally, any limitations to the research will be considered.

1.2 Context of the Study

This section unpacks a brief history of South Africa and the engineering sector.

1.2.1 Brief History of South Africa.

Prior to 1994, racial oppression was the focus of a struggle uniting all Africans and other minorities of colour, inadvertently subordinating issues of gender as women joined their male counterparts in the fight against apartheid (Hassim, 1991). Post 1994, the struggle continues, but with a shifted focus one that highlights the role and identity of women and the inequality they suffer because of gender suffocation. Gendered oppression of Black, Indian and Coloured women renders their experiences different to those of White women as there exists an oppression driven not just by gender, but by other identities such as race and ethnicity: this places them in a margin that has them fighting not just for inclusion as women, but for meaningful inclusion in all structures of society (Govinden, 2008; Hassim, 1991).

South African history is widely known through global recognition of the powerful efforts of the late Nelson Mandela, the African National Congress and other activist bodies in ending the racially oppressive system of apartheid imposed by the then-supremist White Afrikaner Nationalist government. Historically, the country experienced two regimes of oppressive rule: colonialism, followed by apartheid. It is documented that the first Indians came to the Cape in 1684 as slaves during the Dutch colonial era. When slavery ended, people of Indian descent were integrated into the Cape White and Coloured communities (South African History Online, 2011). The year 1860 marked the arrival of Indians under indenture to work on British-owned sugar plantations in Natal, followed by "free" or "passenger" Indians who came to the country 10 years later, but at their own expense, as traders. Following the defeat of the Boer republics in the South African War of 1899 to 1902, South Africa became a dominion of the British Empire with apartheid existing under British rule in practice, if not legally (South African History Online, 2011).

Apartheid—an Afrikaans word meaning "separateness"—was passed into law following the May 1948 general election when Afrikaner nationalism became the politics of the day. Minority White rule and the segregationist laws that were instituted saw a country divided by racial classification. There was a White-dominant category, while Black and other racial categories were subordinate (South African History Online, 2011). Racial categories were introduced by apartheid in four defined race groups: Africans, Whites, Coloureds and Indians (South African History Online, 2019).

Evident during this time was the coupling of race and gender identity and ways in which it intersected the identities of White women, Black men, minority men, Black women, minority women, forming the basis for racist perceptions and stereotyping that inevitably dictated access to power and opportunity (Canham, 2017; Jolaosho, 2018; Haney, 1994; Schamader and Block, 2015). This was advantageous to a minority, but detrimental to the marginalised majority (South African History Online, 2011). A White male-dominated government that instituted and legalised enforced racial oppression (South African History Online, 2011) controlled access to opportunity and economic empowerment.

At the same time, gender oppression was racially dependent, so much so that White women were favoured above other races ("non-White" people) and gender ("non-White" men) owing to their "accepted racial classification" of whiteness, however they remained subordinate to White men owing to the social associations attached to their gender (Canham, 2017; Canham and Maier, 2018). This racialised, gendered oppressive system of inequality fed from the state into home,

education and the workforce. The workforce then consisted of a large proportion of White men, followed by White women, African men and other men in lower-ranked positions. African and minority women were the lowest ranked, doing menial work such as housekeeping and childcare for White households. This division of labour was a response to stereotypical perceptions of minority women and their place in society as workers (Acker, 1990; Andrews, 1998; Bennett, 2006; Levant, Wong and Klann, 2017; Magaziner, 2011).

Following a long period of opposition to apartheid rule, 1994 marked an historic year when the African National Congress was victorious in South Africa's first democratic election. Policies and laws adopted by the incoming government sought to redress past racial disparities (South African Labour Guide Online, 2018). The Employment Equity Act (No. 55 of 1998) was one such law, adopted to address workplace discrimination and ensure equal opportunity and non-discrimination for all South Africans in the workplace (Employment Equity Report, 2018-2019). Through affirmative action measures, the act advocated the elimination of disadvantage in the employment sector experienced by designated groups as a means of bringing about equitable racial and gender representation of the country's workforce (South African Labour Guide Online, 2018).

So, where is South Africa currently in terms of women in the workplace? In keeping with the contextual focus of this research, the following section provides information about the engineering sector globally, and more specifically, within the South African context.

1.2.2 Engineering Sector in South Africa.

The early beginnings of engineering in South Africa formed part of the colonial project (Muller, 2018). The country's first civil engineering contract was for a canal in Cape Town to supply fresh

water to passing ships of the Dutch East India Company (Muller, 2018). The history of this sector is one of roads, mountain passes and railways, together with dams, power stations and transmission lines that enabled settlement and made mining possible. Even water and sanitation were provided mainly for the colonisers, leaving a legacy of separate standards for White and Black, both rural and urban, and serving the interests of a small minority of people (Muller, 2018). These 'separate standards' were further articulated in the closure of career opportunities to other racial groupings and women, this being the main driver of the disproportionate nature of the engineering workforce in South Africa (Muller, 2018). The modern world and its existence are highly dependent on engineering, with engineering fashioned into every aspect of human existence, from medicine and space exploration, to the generation/conservation of energy or the development of more advanced systems (Muller, 2018).

The role that engineers play as preservers of humanity is irreplaceable, bringing about a dependence that drives demand for highly skilled engineers. The Wits University spokesperson, Shirona Patel cited Professor Ian Jandrell, Dean of the Faculty of Engineering and the Built Environment at the University of the Witwatersrand, who argued that "South Africa runs the risk of being left behind and of being marginalised by the global community if we do not consider, as a national priority, the need to invest in universities in general, and engineering in particular" (Patel, 2010, p. 10). Fomunyam cited Professore Jandrell who stated, "It is only universities that can replicate in great measure the high-level scarce skills to move our country forward and to foster development on the continent" (Fomunyam, 2017, p. 6798).

Engineering Council of South Africa for 2015 to 2016 (ECSA, 2021a) statistics showed that of the 16 423 registered professional engineers in the country; more than 70 percent were White. The totals were 13 794 Whites, 1 496 Black Africans, 967 Indians and 199 Coloureds. Furthermore, of the 16 423 professionals, just 713 were female. ECSA (2021a) adds that in 2016, 504 new professional engineers were registered with 438 of them being male and 66 being female. Again, of the 504 total figure, 277 were White, 158 African, 60 Indian and nine Coloured (ECSA, 2021a).

The ECSA statistics for 2017 to 2018 (ECSA, 2021b) on registrations recorded 29 340 professionally registered engineers. Of this total, 1 971 women were registered as against 27 369 men. According to ECSA (2021b), the international benchmark ratio of engineers to population shows South Africa to be lagging in global terms. International norms have one engineer serving 40 people: this highlights the snail pace status of South Africa, which has one engineer per 2 600 people (Mail and Guardian, 2017). Statistics showed that of the 1 971 women registered as engineers, 1 087 are African, 617 White, 218 Indian and 49 Coloured (ECSA, 2021b).

Table 1.1 below reflects statistics recorded in the ECSA Annual Report for 2018 to 2019 (ECSA, 2021c) indicating 19 523 professional registrations, of which 1 138 were women and 18 385 were men, with 15 966 being White (inclusive of males and females). This disproportion raises concerns: given that women make up 51 percent of the South African population: female representation in the engineering sector is alarmingly low.

Table 1.1: Professional Category Registrations

Professional Engineer						
		Total Registrations	New Registrations	Candidate Transfers	Cancellations	De-registrations
TOTALS		19 523	507	0	0	0
Gender	Male	18 385	408			
	Female	1 138	99			
Race	African	2 176	156			
	White	15 966	263			
	Indian	1 149	75			
	Coloured	232	13			

Source: ECSA (2021c).

Table 1.2 below provides a breakdown of the age categories of registered professional engineers. The dominance of White males aged 70+ years is evidence the 'White boys club' that *The Athena Factor* (Hewlett, 2008) referenced is still operating in 2019. It is interesting to note the gradual increase of African professional engineers in the younger age category, in comparison with White engineers. However, compared to African representation in the younger categories, the numbers of Indian and Coloured engineers remain low.

Table 1.2: Professional Engineer category – Age Analysis

Age Groups	African	Coloured	Indian	White
20 - 29	181	16	45	118
30 - 39	3 264	219	748	2 342
40 - 49	2 521	290	701	2 853
50 - 59	653	118	275	3 435
60 - 69	140	30	77	3 537
70+	25	7	20	9 231

Source: ECSA (2021c).

A report released in 2018 by PricewaterhouseCoopers spoke to gender imbalances in the tech industry and the repercussions of this imbalance in the technology sector (PwC, 2018). Upon

reviewing this report, entitled *16 nudges for more #WomenInTech*, clear concern was expressed that the gender imbalance would persist unless collective action was taken by educational institutions to change societal perceptions (PwC, 2018). The report stated that in South Africa, the proportion of females to males graduating with STEM-related (science, technology, engineering and mathematics) degrees indicates women are underrepresented in Math and Statistics (4:5), ICT and Technology (2:5), as well as Engineering, Manufacturing and Construction (3:10). As a result, there is a significantly smaller pool of female STEM talent, restricting the potential of South Africa's technology sector (PwC, 2018).

Findings from a 2017 census report by the Business Women's Association of South Africa (BWASA) showed high pass rates of STEM female graduates (21,2 percent), but low representation in the workforce (7 percent) (BWASA, 2017). BWASA ascribed this mainly to societal perceptions having been incubated within the home, community and the workplace about the role women should play – a role reinforcing a notion of "normalcy", or "the accepted way of life", i.e. patriarchal norms and values (BWASA, 2017).

For ethnic woman, gender is not the only category of her identity that diminishes her; it is just one of the many identities informing the multiple oppressions she will experience (Crenshaw, 1991; Magaziner, 2011; Weber, 1998). These layers of discrimination come not only from males of the other race, but from her own, as well as from women who do not share her racial grouping (De la Rey, 1997; Perdue, Dovidio, Gurtman and Tyler, 1990). According to King Miller (2017, p. 1) "historically, women have faced systematic barriers with regard to their participation in science, technology, engineering, and mathematics". This was attributed to perceptions about the identities

and roles of women stemming from past regimes of oppression, which created social meanings as a way of classifying people based on race, gender and class (King Miller, 2017). These systems of meaning advocated the social inequalities that were prevalent then and the disparities evident even now, after the desolation of past inequality regimes, and continue to impede skills development (Mayer, Surtee and Mahadevan, 2018; Qureshi, 2014).

These perceptions, it has been argued, to some extent drive the psyche of women about their abilities and attitudes regarding their interest in engineering, as well as perceptions of their abilities (Hooks, 1989; Triandis, 1989; Bell, 1990; Hewlett, 2008; Miramontez, Benet-Martinez and Nguyen, 2008; Sanchez-Hucles and Davis, 2010; Gordon, 2018; Mayer, Surtee and Mahadevan, 2018). This self-perception of ability is founded on societal attitudes about the role of women that influences the way women perceive themselves (Moreno et al., 2000). The study by Moreno et al. (2000) indicates that as a result of societal attitudes about the role women should occupy, female students consistently begin their engineering studies with a lower confidence in their background knowledge about engineering, their abilities to succeed in this field, and their perceptions of how engineers contribute to society than do their male counterparts. This androcentric suffocation is expanded in the *The Athena Factor* (Hewlett, 2008).

The Athena Factor describes the global experiences of women in STEM careers and women/girls who opt for STEM degrees, exploring the career trajectories of women in science, engineering and technology (SET) in 43 global corporate settings in the United Kingdom and United States (Hewlett, 2008). Findings from this report showed that women in SET exuded a passion for their careers, but also suffered the presence of (a) hostile macho cultures, (b) isolation, (c) mysterious

career paths, (d) systems of risk and reward, and (e) extreme work pressures (Hewlett, 2008). These antigens, as the report labelled them, saw women finding themselves in precarious situations that led to a fight-or-flight response, i.e. whether to remain career-orientated or exit the profession (Hewlett, 2008).

Cracking the code: Girls' and women's education in science, technology, engineering and mathematics is a 2017 report by the United Nations Educational, Scientific and Cultural Organization (UNESCO) that states girls' under-representation in science, technology, engineering and mathematics (STEM) education is deep-rooted and applies a detrimental brake on progress towards sustainable development (UNESCO, 2017). "Girls and women are key players in crafting solutions to improve lives and generate inclusive green growth that benefits all. They are the greatest untapped population to become the next generations of STEM professionals – we must invest in their talent" (UNESCO, 2017, p. 4).

The UNESCO report looks at the individual level, family-peer level, school level and society level factors influencing participation, progression and achievement in STEM education as well as the interventions at these levels that can increase interest and engagement in STEM education (UNESCO, 2017). It emphasises the multiple and overlapping factors that influence girls' and women's interest in, and engagement with, STEM, all of which interact in complex ways. The report posits that the disadvantage faced by girls is not based on cognitive ability, but derives from the socialisation and learning processes within which girls are raised and which shape their identity, beliefs, behaviours and choices (UNESCO, 2017, p. 72).

Value-driven organisations, such as Women in Engineering (WomEng), a South African organisation catering for women in engineering and founded by women engineers, seek to break the shackles of the 'socialisation process', robustly articulating this through their leadership programmes as means of encouraging girls and women to embark on STEM careers (www.womeng.org). LaunchPad, GirlEng and Network are some of the major projects they have embarked on to "attract, develop and retain the pipeline of women engineering leaders globally through a series of robust programming and interventions at every stage of the pipeline" (www.womeng.org). Nevertheless, what do statistics tell us about how women feature in this sector?

Out on a Rib, an article by Manglin Pillay, former CEO of the South African Institution of Civil Engineering (SAICE), published in the institution's July 2018 issue, affirms the infiltration of societal perceptions based on gendered ideologies that drive the stereotyping and bias faced by women in engineering (SAICE, 2018). Pillay refers to studies carried out by Leeds University and the University of Missouri that claim women in gender-equal egalitarian societies are less likely to choose STEM careers (SAICE, 2018). Pillay infers that women choose not to engage in STEM careers and high-profile positions, dedicating themselves to "more important enterprises, like family and raising children, [rather] than to be at the beck and call of shareholders" (SAICE, 2018). Pillay (SAICE, 2018) also questioned why the South African Government was investing so heavily in women in STEM if they exit their professions early anyway.

These generalisations sparked outrage among female engineers, one of whom acrimoniously voiced her displeasure (Pillay, 2018) regarding the inferences in the CEO's article by stating:

> *Females in engineering get to experience what's referred to as the hard-hat culture, as well as maternal profiling –* ***Hard-hat culture*** *is characterised by a "macho culture", predatory behaviour and often language flavoured with vulgarity and sexual innuendos;* ***Maternal Profiling*** *describes the ability to question a woman's commitment to the labour force and to then downgrade her abilities due to her potential to be a mother… Then there is the sweeping assumption you make that women do not choose to become CEOs because they prefer more flexibility to raise their families.*

The same female engineer (Pillay, 2018) went on to state:

> *While society may have, most men believe that this is a choice we make… Women being domesticated and then leaving employment or opting for more flexible working times, to stay home with our families, is not a choice – it is sometimes the only option for some women. Due to a lack of support systems or organisational policies which are unable to support parental leave policies and onsite child-care; parents do not have the luxury of raising their children in a gender-equal home. We are still part of a society which places the burden and expectation of being the breadwinner on that of a male. Our organisational policies more often than not, make allowance for a woman to dismantle her career to care for a child, whilst a father is not allowed longer than a few days to be part of an infant's life.*

What is problematic about this scenario is firstly, the prevalence of the generalisation error, which alludes to the single-axis analysis of women to which Crenshaw made reference in 1989, and which was clearly still prevalent in 2018 (Crenshaw, 1989; Yuval-Davis, 2006). This approach to woman's identity and roles in relation to her vocational orientation distorts the complexities stemming from the intersectional nature of her identities and how these influence the bicultural space within which she must navigate.

According to the SAICE article, the CEO based his opinions on literature he had reviewed that spoke to a developed, Eurocentric context. Hence, his application of the data he obtained to a South African developing situation is a misrepresentation of debates around race, ethnicity and gender in a diversified Third World context (SAICE, 2018). With the current low representation of women in engineering, it is interesting to unravel what factors influence an ethnic minority woman within her bicultural space to remain career-orientated – even when faced with adversity in the form of stereotypical perceptions about her intersecting identities (Hooks, 1989; Crenshaw, 1989; Bell, 1990; Ryan and Haslam, 2005; Schwartz and Unger, 2010). Answers to this can be key triggers for retention strategies, as well as suggesting different motivational methods to halt shrinkage of the pool of professional women engineers.

1.3 Identified Literature on Biculturalism and Career Orientation

To begin unravelling answers to this question, it is necessary to refer to the main authorities and their research-specific literature: this will inform the conceptual framework within which the problem for the current study will be positioned. Some of the most significant literature reviewed for this study included the concept of *double consciousness* developed in 1903 by American sociologist and activist William Du Bois (Du Bois, 1969); the ideas of *social identity and social categorisation* (Tajfel and Tuner, 1979, Booysen, 2007;); the concept of *location and space of marginality* (Hooks, 1989); *identity as a plural, multi-layered state of change* (Ashforth and Mael, 1989); *intersectionality theory* (Crenshaw, 1991); *social cognitive career theory* (Lent, Brown and Hackett, 2002; Brown and Lent, 2017); the debates of (Bell, 1990; Benet-Martinez et al., 2002; Benet-Martinez, Lee and Leu, 2006; Chen, Benet-Martinez and Bond, 2008; Huynh and Benet-

Martinez, 2011; Brannen and Thomas, 2010) on *biculturalism*; the concept of *gendered organisations* (Acker, 1989, 1990, 1992, 1998, 2000, 2006); *women and leadership* (Richter, 1990; Ryan and Haslam, 2005); *social and organisational identity* (Alvesson, Sveningsson, 2003; Alvesson, Ashcraft and Thomas, 2008); and the "Think manager – think male" bias explained by Schein, Mueller, Lituchy and Liu (1996).

Intersectionality

Work by the founding mother of the theory of intersectionality, Kimberlé Crenshaw (1989), provided a comprehensive understanding of the theoretical underpinnings and practical implications of intersectionality and its application to identity. Race and gender, in this instance, are not viewed as separate variables, but rather considered with the view that each informs the other and therefore must be explored using an intersectional approach of investigation (Crenshaw, 1989, 1991). In 1903 Du Bois coined term "double consciousness" (Du Bois, 1969) which converges some 85 years later through the focus of Hooks' works on race matters and marginality, which she described as "otherness": components that informed a world which saw an individual straddling two differing cultural contexts, in the bicultural space (Hooks, 1989).

Biculturalism

The main sources reviewed on the area of biculturalism for this research were Bell (1990), Denton (1990), LaFromboise et al. (1993), Orlando and Graimes (1996), Bell and Nkomo (1998), Barrios and Egan (2002), Benet-Martinez et al. (2002, 2006), Barrett, Cervero and Johnson-Bailey (2003), Moss (2005); Bell (1990, 2006), Padilla (2006), Kanungo (2006), Fearfull and Kamenou (2006), Lu (2008), Beharry and Crozier (2008), Stroink and Lalonde (2009), Thomas, Brannen and Garcia

(2010), Schwartz and Unger (2010), Mistry and Wu (2010), Acevedo-Polakovich, Niec and Barnett (2014), Huynh and Benet-Martinez (2011) Rudolph, Castillo, Garcia, Benet-Martinez and Navarro (2015), Carrim (2012, 2016), Jaga, Arabandi, Bagraim and Mdlongwa (2018) and West et al. (2017). Most of the authors listed above provide meaningful insight into bicultural experiences, although limited to the experiences of African American, Hispanic and Latino people from an American or European context. All the authorities listed above posit that a woman's identity in the workspace is highly dependent on her ability to successfully self-navigate between two separate spaces with differing norms and expectations (personal and organisational contexts). In other words, a bicultural space.

Indian Women

Scholarly work on the global experiences of Indian women in relation to their class and gender, but focusing on shared personal culture, was conducted by Reddock (1985), Crampton and Mishra (1999) and Thanacoody, Bartram, Barker and Jacobs (2006). Studies by Dasgupta (1998), Inman, Howard, Beaumont and Walker (2007) and Beharry and Crozier (2008) explored the South East Asian experience from a Western context, including countries such as America, Canada, New Zealand and the United Kingdom. In terms of the interplay between social and organisational cultural contexts—as is the nature of the bicultural space—location gives rise to context. This refers also to the influence of history. Systems of oppression and domination exercised by the oppressor over the oppressed inform the continuous shaping and reshaping of the context. This influences the way an individual experiences his or her life story as the oppressed.

The Black-White Dyad

In an emerging market context, such as South Africa, literature on women's bicultural identity experiences in the workplace is available, but focusing mainly on the African female experience (Booysen and Nkomo, 2010; Bullough, Moore and Kalafatoglu, 2017). This literature that spoke to a White-Black dyad presumably followed on from the oppressive apartheid regime. During the apartheid period, literature-addressing issues of race and minorities was centred on a White perspective, norms and values, with Black and other minorities not being given a voice. Any attempt to write was seen as a crime against the then White government, with severe consequences (Govinden, 2008).

The apartheid system of oppression was racially based; hence, when South Africa became a democracy, the aim of addressing issues of racial disparities superseded gender matters and gave way to an accompanying trend of public discourses centered on matters of race. This focus on race was seen through a lens that emphasised the White-Black agenda with less focus on other minority groups, specifically, in respect of this study, Indian women (Carrim, 2012, 2016; Carrim and Nkomo, 2016; Ahmed and Carrim, 2016; Jaga et al., 2018). In South Africa, transformation and equity agendas are currently the main items on the state's agenda for redress, following the social disparities of apartheid. The Black-White context is still a much-debated area and dominates literature, based on concerns and problems related to redress of past wrongs whose effects presently persist. In this young democracy, South African Black and ethnic minority academics are only now engaging in full-scale academic writing.

Pockets of knowledge pertaining to literature dealing with the Black majority are growing, which is not yet the case for other ethnic minorities. Booysen and Nkomo (2010) and Bullough et al. (2017) researched some studies that consider the Third World context, but their units of analysis failed to include one unique group of women from the Indian population: professional engineers. With the exception of studies conducted by Carrim (2012, 2016), Carrim and Nkomo (2016) and Ahmed and Carrim (2016) that focus on South African Indian women in the workplace (specifically relating to research on areas such as identity work), and the studies by Bhathuram and de Kadt (2003), Radakrishnan (2005), Khan (2012) and Jaga et al. (2018) pertaining to work-family conflict, there remains a dearth of literature about the bicultural experiences of these women in the engineering space in relation to their career orientation.

The rise in numbers of female graduates is indicative of a radical shift in the professions selected by women entering higher education institutions (BWASA, 2017). What is not found in the literature reviewed is any empirical data dealing with the influence of identity intersection on the bicultural life experiences of South African Indian women engineers, listing factors that trigger their decision to remain career-orientated. Most literature on South African Indian women focuses on women in management roles, and those in professional roles other than from the engineering sector (Carrim, 2012, 2016; Ahmed and Carrim, 2016; Carrim and Nkomo, 2016).

This study proposes to close the gap identified here using narratives extrapolated from this unique grouping of women. This sample is unique, given its members' historical background. It is a background encompassing a tight collectivistic culture informed by patriarchal ideologies that turned womens' choices of profession into a radical statement against the ubiquitous cage of

gender oppression – a muzzle that has, for decades, silenced their voice in space and literature. Their intersecting identities will set their experiences apart from another minority, given their cultural difference, which informs a socialisation process that may share some commonalities with others, yet retains its uniqueness through its differences (Crenshaw, 1989; Crenshaw, 1991; Bell, 1990).

1.3.1 Study Rationale.

With the dawning of the fourth Industrial Revolution, the need for greater involvement of women in STEM professions becomes increasingly important if their presence in the workplace is to be retained. A 2016 article by the World Economic Forum indicates the negative consequences of the low representation of women in STEM professions, stating that although STEM is one of the fastest-growing areas of job creation, women stand to gain only one new STEM job for every 20 lost across other job families, whereas the ratio for men is one new job for every four lost elsewhere (WEF, 2016).

If gender equity in the engineering space is to be achieved, it must be established whether the proverbial "glass ceiling" is indeed shattered for all, or still blocks some (Haslam, 2005, 2011; Bullough et al., 2017). Equity policies may not suffice if a deeper understanding of systemic issues at grassroots level for different groups is lacking. Seeking life stories from the selected group of women who may have faced discrimination and disadvantage, based on their intersecting social constructs of identity, namely gender and race, provides insight into a possibly different perspective about biculturalism and how this translates to career orientation for minority women (Ollerenshaw and Creswell, 2002; Boas, Dayan-Horesh and Adler, 2005; Booysen and Nkomo,

2010; Booysen, 2007; Booysen, 2018; Lent, Hackett and Brown, 2008; Lent, 2013; Rooney, Lawlor and Rohan, 2016).

The bicultural life experiences of career-orientated South African Indian women engineers are currently an under-researched area (Carrim, 2012, 2016; Ahmed and Carrim, 2016; Ahmed, 2016; Carrim and Nkomo, 2016). Studies pertaining to the domain of biculturalism and career development provide empirical data that focuses on African American or ethnic minorities from Western countries with limited information on a Third World context (Bell, 1990; Denton, 1990; LaFromboise et al., 1993; Orlando and Graimes, 1996; Bell and Nkomo, 1998; Barrios and Egan, 2002; Benet-Martinez et al., 2002; Barrett et al., 2003; Moss, 2005; Bell, 2006; Padilla, 2006; Kanungo, 2006; Fearfull and Kamenou, 2006; Lu, 2008; Beharry and Crozier, 2008; Stroink and Lalonde, 2009; Thomas et al., 2010; Schwartz and Unger, 2010; Mistry and Wu, 2010; Acevedo-Polakovich et al., 2014; Rudolph et al., 2015; West et al., 2017).

In the literature with a South African context that does exist, most studies have focused largely on the experiences of Black African women, women in management positions and in professional roles, but with a focus on the African majority and White minority (Bell, Nkomo and Scully, 2003; Booysen, 2007; Booysen and Nkomo, 2010; Booysen, 2018; Bullough et al., 2017; Boswell, 2017). This has created a gap in the literature specific to South African Indian women as professional engineers which could provide insight into: (a) what makes South African Indian women choose engineering as career*;* (b) what motivates them to enter the arena of engineering*;* (c) how do they manage their personal and professional lives*;* and most importantly for this research, (d) what informs their decision to remain career-orientated?

While most of the relevant academic literature talks to why women leave and why it is important to motivate young girls to opt for STEM degrees, there is limited research dealing with why women engineers stay, specific to a minority in a Third World context (Hewlett, 2008; Dasgupta and Stout, 2014; Akinlolu, 2018; Arthur and Guy, 2020).

The benefits from extracting such information will include the ability to highlight to government, the engineering community and career counsellors the importance of not only focusing on what makes women leave, but also of finding out why women stay: this may articulate into a different perspective on what methodologies can prevent the small compliment of women in the workforce from leaving (Hewlett, 2008; Dasgupta and Stout, 2014; Arthur and Guy, 2020). The deliberate choice of a minority grouping with "intersecting identities" as a sample, highlights that within groupings of women deemed to be homogenous (based on stereotyping by social tags such as race, gender and ethnicity), an appreciation of heterogeneity is key if significant equity is to be achieved and women retained in the workforce (Crenshaw, 1989; Bell, 1990; Booysen and Nkomo, 2010; Jenkins, 2014; Bullough, Moore and Kalafatoglu, 2017). To end exclusivity, inclusivity has to become meaningful and not just a box to tick or an act of tokenism to formally comply with legislation on race and gender equity in the workplace.

Statistics presented by the South African Commission for Employment Equity (2017, 2019) in its Annual Reports for 2016/2017 and 2018/2019, in Tables 1.3 and 1.4 respectively, show that employment representation in terms of gender and race still presents as a challenge. White males dominate nearly all the sectors. White females have a high level of representation in all sectors

compared to other females in most sectors. African females still present lower representation by percentage compared to White females in STEM-related sectors such as mining and construction. Meanwhile, lower representation is reflected in these sectors for Indian and Coloured women. The recorded statistics for 2018/2019 indicate a similar trend to that of 2016/2017 in terms of low numbers of Indian women, specifically in the mining and construction sectors, with White women dominating these sectors, followed by African women (SACEE Annual Report, 2019). Statistics presented in Tables 1.3 and 1.4 point to glaring gaps in the distribution of women by race. Table 1.3 below indicates the representation of men and women by race per industry:

Table 1.3: Racial Representation by Industry (2016-2017)

SECTORS	MALE				FEMALE				FOREIGN NATIONAL		TOTAL
	African	Coloured	Indian	White	African	Coloured	Indian	White	Male	Female	
Agriculture	19.8%	6.0%	1.9%	37.2%	10.0%	3.1%	1.2%	19.1%	1.3%	0.3%	100.0%
Mining and Quarrying	26.5%	3.3%	2.4%	42.6%	9.3%	1.1%	1.4%	10.6%	2.5%	0.4%	100.0%
Manufacturing	14.7%	6.8%	8.5%	38.0%	6.7%	3.4%	4.1%	15.3%	2.1%	0.5%	100.0%
Electricity, Gas and Water	30.1%	5.3%	5.8%	22.4%	22.2%	2.4%	2.6%	7.2%	1.6%	0.3%	100.0%
Construction	24.7%	7.4%	4.6%	38.2%	8.5%	1.7%	1.6%	9.9%	3.0%	0.5%	100.0%
Retail and Motor Trade/ Repair Service	15.9%	7.3%	7.0%	25.2%	12.6%	7.3%	4.5%	19.1%	0.8%	0.4%	100.0%
Wholesale Trade/ Commercial Agents/Allied Services	15.0%	5.8%	7.2%	29.5%	8.8%	4.5%	5.1%	21.9%	1.7%	0.5%	100.0%
Catering/Accommodation/ other trade	19.3%	5.1%	3.6%	18.8%	17.9%	6.6%	3.1%	20.8%	3.2%	1.4%	100.0%
Transport/ Storage/ Communications	21.6%	6.3%	7.6%	29.4%	10.8%	3.1%	3.8%	13.4%	3.2%	0.6%	100.0%
Finance/Business Services	13.9%	5.1%	6.9%	24.9%	13.1%	5.6%	6.4%	20.7%	2.4%	1.1%	100.0%
Community/ Social/Personal Services	24.9%	3.8%	2.1%	8.5%	37.8%	5.1%	2.6%	12.8%	1.7%	0.9%	100.0%

Source: Commission for Employment Equity (2017).

Table 1.4: Racial Representation by Industry (2018-2019)

SECTOR	MALE				FEMALE				FOREIGN NATIONAL		TOTAL
	AFRICAN	COLOURED	INDIAN	WHITE	AFRICAN	COLOURED	INDIAN	WHITE	MALE	FEMALE	
Agriculture	5.8%	2.7%	1.1%	72.0%	2.0%	1.9%	0.3%	13.3%	0.8%	0.1%	100.0%
Mining and Quarrying	20.5%	2.6%	2.5%	54.3%	7.1%	0.7%	1.2%	7.8%	3.0%	0.4%	100.0%
Manufacturing	5.8%	3.3%	9.3%	58.7%	3.0%	1.6%	2.8%	10.4%	4.5%	0.5%	100.0%
Electricity, Gas and Water	22.4%	4.8%	5.7%	38.4%	12.7%	2.3%	3.6%	6.1%	3.5%	0.4%	100.0%
Construction	13.8%	5.5%	5.9%	55.9%	5.3%	2.0%	2.5%	6.7%	2.2%	0.3%	100.0%
Retail and Motor Trade/Repair Service	4.7%	3.3%	8.9%	59.8%	2.0%	2.0%	2.8%	14.8%	1.4%	0.2%	100.0%
Wholesale Trade/ Commercial Agents/Allied Services	4.7%	2.7%	10.7%	55.9%	2.8%	1.4%	3.7%	14.7%	2.8%	0.6%	100.0%
Catering/ Accommodation/ other trade	8.9%	2.4%	4.5%	49.3%	5.6%	2.3%	2.4%	20.4%	3.6%	0.8%	100.0%
Transport/ Storage/ Communications	11.5%	3.4%	9.4%	46.7%	6.4%	2.4%	4.2%	11.0%	4.6%	0.4%	100.0%
Finance/Business Services	9.4%	2.7%	5.8%	50.3%	5.7%	2.3%	3.4%	16.2%	3.3%	0.9%	100.0%
Community/ Social/Personal Services	21.7%	4.0%	5.1%	33.3%	11.5%	2.2%	3.1%	17.0%	1.4%	0.7%	100.0%

Source: Commission for Employment Equity (2019).

These statistics raise questions about the skewed representation of South African women in the engineering/construction industry and prompt deeper investigation of the problem. The current dearth of literature makes this trend incomprehensible and as such, problematises this skewed representation. This begs the question: Is "something" driving this trend? If so, what? Currently, not much is known that is specific to each racial category of women, and this grey area has the potential to create a blind spot when it comes to analysis of issues of gender, race and women in engineering, resulting in the adoption of a generalised approach to what are actually deep-rooted issues involving multiple complexities.

This 'blind spot' is expressed in the 2018 article by SAICE CEO, Manglin Pillay (2018), who formulated his arguments about women exiting engineering in one particular Third World emerging market—South Africa—based on literature from two overseas universities in a First

World context. Manglin Pillay's perspective is one that treats women as a homogenous grouping, failing to engage with their unique cultural histories that inform a socialisation process which varies their social tags and separates their experiences. The response by Kamentha Pillay to the CEO's article provides an important source confirming the reality of a bicultural space, and the different challenges of managing intersecting identities that women engineers must face in this industry and the choices they must make in terms of their careers (Pillay, 2018).

1.4 Problem Statement

Bicultural women must navigate between two very different worlds, each with its own value systems that either promotes or inhibits progression. These value systems and the founding principles upon which they are premised, labels navigation for these women, especially in a male-dominated profession, as the core factor that influences her decision to stay or exit the profession. Much is written and known about why women engineers leave their profession as well as why it is important to orientate young girls to opt for STEM-related degrees. However, there is limited literature on why women who have a bicultural existence choose to remain in the professional space of engineering.

1.5 Purpose Statement

The purpose of this study is to understand what informs a South African Indian woman engineer's decision to remain career-orientated. The findings of this study will articulate the cognitive stages in career development that a bicultural woman goes through and that influence her decision to stay

in her profession. This will be done through an investigation of the interplay between her intersecting identities of race and gender and the contextual factors within a bicultural space (which act as support or barriers) to establish the influence of these contextual factors on her social cognitive processing (self-efficacy and outcome expectations); and how these processes inform her career choice and action/behaviour, that is, to remain in her profession as an engineer. The findings of this study will add nuances to the existing literature in the area of biculturalism and career development through its exploration of a population sample whose members remain underrepresented in research.

1.6 Contributions of the Study

This section provides a brief overview on some of the academic discussions around what a research contribution entails. The conception of the current research will be explained against these schools of thought, explaining the nuances expected from the envisaged study and how this offers value to the body of knowledge in the field of biculturalism and identity. How does a researcher know if potential research will yield significant contributions to a body of knowledge? Sara Rynes, a former editor of the *Academy of Management Journal*, listed six criteria that Campbell and colleagues developed to assist in choosing a research study that will make a significant contribution to knowledge (Rynes, 2002; Rynes and Gephardt, 2004):

a) **Activity –** Frequent interactions, being in the right place at the right time, chance, and contact with management and colleagues are related to the beginning of good research ideas.

b) **Convergence –** There is a sense that several activities or interests converge at the same time (e.g., an idea and a method). Convergence appears related to the notion of activity because it is through activity and exposure that the investigator is able to be at the convergence point of several events.

c) **Intuition –** The importance of the research and the interest in it seem to be guided by intuition and feeling, rather than by logical analysis. Investigators often express a feeling of excitement or commitment, a perceived certainty; as if they "know" at a deeper level, they are doing the right thing. A great deal of intrinsic interest is also present.

d) **Theory –** A concern with theory also appears important. A primary goal often is to understand or explain something about organisational behaviour. The investigator is curious, concerned, puzzled, or wants to clarify something that is poorly understood.

e) **Real world –** Often the research problem has an applied, real-world flavour. The ideas often are tangible, useful and pertaining to on-going organisational activities. Often the idea arises from contact with nonprofessional's in organisations.

f) **Personal Commitment and Motivation –** Significant research is more likely to be undertaken because of the personal interests of the investigator rather than because the research is acceptable to the discipline (and publishable). The investigator is likely to have strong beliefs about the expected outcome (which often conflict with conclusions from existing research) **(**Rynes, 2002, pp. 312-313).

1.6.1 Main Research Contributions.

The elucidation by Rynes (2004) of Campbell's six criteria can be employed to define a subject area eligible for investigation. These criteria informed the thought processes and selected

academic literature that speak to the significance of the proposed research**.** In the case of the current researcher, attending a Seminar for Women in Leadership sparked initial interest about the work life versus social life experiences of women and their influence on career decisions. Discussions at the seminar fulfilled Campbell's criteria of **activity** that reflected **a real world** challenge requiring scientific investigation. The seminar was hosted in Johannesburg in 2017 at the Wits Business School, and took the form of a platform where Black women in positions of leadership shared anecdotal information about work life experiences.

This informative session brought to light the woes of being a "women in a man's world" and the continuing battle to remain resilient in the face of traditional perceptions of identity and role expectations. The prevalence of patriarchal ideologies was expressed by these African women who confided to the audience their encounters with sexual harassment and their decisions to remain silent for fear of "upsetting the apple cart", at work and at home. Most of these women described the hardships involved in attaining their current positions and believed that if word of their experiences leaked out, it would lead to marital discord on the home front and opportunities to move up the ladder being stifled in the workplace.

Following this seminar, the researcher had an informal conversation with an Indian woman in a very senior position at a large, well-known and successful organisation (Anonymous, Personal conversation, 2017). This was not planned, but presented as an opportunity to the researcher in her capacity as a manager at a university, the researcher's place of employ. This individual's account of what it meant being a woman, and Indian, in a position of leadership and in terms of the experiences, she encountered and would encounter, articulated similarities to the narratives

expressed by the women at the seminar. Campbell's **convergence** criterion was evident at the exact moment the experiences of the women at the seminar were echoed by someone who was not even in attendance. This convergence of narratives highlights a problem that needs to be explored through scientific enquiry.

This anonymous confidante related her first experience of the "old White boys club" when she was newly appointed and walked into the boardroom full of men. She said, "[T]he White men looked at me with mocking smiles, the Indian men looked through me". She added, "They used to invite me to golf day events knowing I am a single mum" (Anonymous, Personal conversation, 2017). This only made her even more determined not to be bullied (Anonymous, Personal Conversation, 2017). She laughingly related how just a year later the very same men who had looked down on her or through her, looked up to her, all because she chose to stand her ground and not become "one of the boys" (Anonymous, Personal conversation, 2017).

It was coincidental that such information was presented to the researcher. Not to romanticise this impromptu conversation, however, the anecdotal information about women the researcher barely knew, motivated the suffragist within and ignited Campbell's **Personal motivation and commitment step**. Their **real world** experiences intrigued the researcher so much so that there was a need to find out about the "more" (**Intuition criteria)** that was currently untapped significant information about the challenges women, even now in the 21st century, continue to face. Rynes (2002) advised that as per Campbell's **theory criteria,** a concern with theory is important. A primary goal often was to understand or explain something about organisational behaviour. The investigator was curious, concerned by a puzzling issue, or wanted to clarify something that was

poorly understood (Rynes, 2002). This sparked the review of literature covering the areas of biculturalism and career development.

Gaps in the literature suggested the trajectory and desired sample for this study. The paucity of literature pertaining to South African Indian women—given the researcher's own background as an Indian woman in a managerial position—raised questions about how one would know whether the experiences of all other minority women are similar, or have elements that make them uniquely different. Following the recommendations of career theorists Fouad and Santana (2017), who called on future researchers to look at the influence of identity intersection on minority women in STEM entry and retention, the current study attempts to investigate how intersecting identities of South African Indian women engineers within their bicultural contexts (support and barrier factors) trigger their social cognitive processing, and the influence of such processing on their decision to remain career-orientated.

1.6.2 Theoretical Contribution.

By assimilating key concepts from biculturalism and social cognitive career theory, this research will make a theoretical contribution to the body of knowledge in both domains by way of an adapted version of Lent's SCCT model represented as a Bicultural Social Cognitive Career Trajectory (BSCCT), showing factors that encourage efficacious social cognitive processing that positively influence a bicultural person's choice to remain career-orientated. This research offers instrumental insights to the engineering community within the private and public domain, as well as career counsellors, on what factors influence women to stay: if applied effectively, this can assist in detecting early "flight risks" and how to manage these amicably. The factors identified

will not only help management to understand what motivates these women to stay, but provide for future research to triangulate the data with data obtained from a different minority to establish whether these are domain-specific or individually driven career development trends.

1.6.3 Empirical Contribution.

The life stories from this research will provide an empirical contribution, given that they come from a sample of women who hardly feature in current literature on biculturalism and social cognitive career theory. This study will supplement the current literature and give a voice to a specific group of minority women – South African Indian women engineers. By focusing on a less-studied minority group, a nuanced addition to what is already known about this phenomenon is highly possible. There are listed studies in this research that explore minorities, but context questions whether the findings of these studies on minorities can be associated with what minorities in a developing Third World context experience.

African American history and that of other minorities globally share a similarity – the oppression that comes from their intersecting identities. However, their personal contexts (*values, norms and cultural ideologies*) and how these interact with the politics, economics and legality within their social context, differentiate their experiences from those of other oppressed groupings. Their experiences therefore cannot be used as a representation of other minorities with their unique personal contexts, coupled with their specific social contexts.

1.7 Delimitations of the Study

The research is limited to South African-born Indian women who are employed as engineers in an engineering company in any of the nine provinces in South Africa. Because of the specific criteria used to select respondents, the findings of this study will not be applicable to all South African Indian women in the workplace.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter will review the relevant academic literature, expanding on selected theories that will inform the conceptual framework for the study, which, through its application of a suitable methodology, will aim to answer the main research questions. This will commence with a review of theories pertaining to identity, biculturalism, intersectionality and social cognitive career, together with the studies making up the associated body of knowledge. This is followed by an expansion of the two differing contexts, namely social and organisational, and elucidation of the identity tags of race, gender and ethnicity. Convergence points of these theories are presented that will inform the conceptual framework of the study.

2.2 Literature Reviewed

The literature reviewed below is presented in alignment with the focus areas of this study, these being biculturalism and career orientations. The section will begin by exploring literature that covers identity, stemming from which biculturalism will be considered. This will be followed by a review of the Social Cognitive Career Theory with an emphasis on self-efficacy expectations and action behaviour related to career development. At the conclusion of each part, the researcher will present a research question that the review informs in relation to the investigations of the current study.

2.2.1 Identity.

In lay terms, identity covers the values and norms to which a person is conditioned from birth and that he/she attaches to him/herself as social tags facilitating location within a specific context. Richard Jenkins describes this phenomenon as the ways in which individuals and collectives are distinguished in their relations with other individuals and collectives (Jenkins, 2014, p. 18). An individual's interaction with the wider world complicates the nature of this phenomenon and renders it fluid, as opposed to fixed, and in the same fashion makes the phenomenon a complex one (Richard and Grimes, 1996). Lincoln and Guba (1985) explain this fluidity when they state that multiple realities also depend on other systems for meanings, making them even more difficult to interpret in terms of fixed realities. These systems of meaning make reference to a societal response to the question of identity – a response that advocated hierarchical categorisation based on social associations attached to individuals' differing races, genders, ethnicities and class (Perdue et al., 1990). These "systems of meaning" were catalysts for the global greater evils of society such as slavery, apartheid and holocausts, all of which followed domination by oppressor over oppressed. So began the plight of every person who did not share ancestry or colour with the oppressor (Chen and Benet-Martinez, 2008; Benet-Martinez et al., 2002).

To begin this journey, it was crucial to refer to the major authorities and literature covering identity. Some of the experts on identity studies relating to women in the workplace that were examined were Tajfel and Turner (1979), Acker (1992), Richter (1990), Ryan and Haslam (2005), Alvesson et al. (2008), Chauhan (2010), Stoermer, Hitotsuyanagi-Hansel and Froese (2017), Adler (1986), Chisholm (2001), Littrell and Nkomo (2005), Schein (1996) and Barnes (2017): their studies explored the issues of race and gender-identity challenges facing women in the workplace. These

studies focus on embedded ideologies and socio-historical contexts globally, and mostly consider Black or ethnic minorities in a Western context.

"Who am I and what is my purpose?" This profound question has informed many discussions on identity and the nature of its construction in an individual's life structure (Alvesson et al. 2008; Korte, 2007; Gill, 2015; Schwartz, Luyckx and Vignoles, 2012; Turner-Zwinkels, Postmes and Van Zomenen, 2015; Tajfel and Turner, 1979). Psychologists have described *self* as a "bounded cognitive schema" with core and peripheral concepts linking the personal to the social (Korte, 2007). Related to this is the process of inter-identity: this is argued to be the overlap of multiple identities within self in relation to the social world, and has the potential to affect an individual's sense of personal wellbeing, coping mechanisms, levels of self-esteem, levels of stress and behaviour towards others (discrimination) (Turner-Zwinkels et al., 2015, p. 1). It is stated that identity cannot be explored as a stand-alone, fixed notion of being but only as a multi-layered state of change. Each such layer is interacting, influencing, enabling, inhibiting, shaping and reshaping one person's history, or in the case of this research (her) story (Ashforth and Mael, 1989; Barnes, 2017, Du Gay, 2007; Huynh, Nguyen and Benet-Martinez, 2011). Getting the "right" fit is crucial.

Two factors that could promote inter-identity fit are *holisticness* and *self-definingness*. Holisticness makes reference to group identity that provides a philosophy for life, while self-definingness refers to the extent an individual chooses to conform to that philosophy of life (Benet-Martínez, Lee and Leu, 2006; Turner-Zwinkels et al., 2015). If one of the social identities within self is derived from the group philosophy (norms and teachings, etc.) the likelihood is much higher that this influences the individual's behaviour in differing contexts where other identities of the

self are salient (Turner-Zwinkels et al., 2015; Benet-Martínez, Lee and Leu, 2006; Ashforth and Mael, 1989). Inter-identity fit presents a dimension of understanding that this study will explore in terms of how gender and race, as static constructs of identity, react or relate to an individual's context (Haney, 1994; Davis, 1997; Weber, 1998; Bhopal, 2005; Schmader and Block, 2015). Findings from this research will inform the reality of the study by Turner-Zwinkels et al. (2015) into whether inter-identity fit can positively affect the sense of personal wellbeing, coping mechanisms, levels of self-esteem, levels of stress and behaviour towards others (Perdue et al., 1990).

One of the most significant theories to explain identity is that presented by Tajfel and Turner (1979), through Social Identity Theory (SIT). They describe social identity theory as "categorization in terms of a group membership, and having defined themselves in terms of that social categorization that individuals seek to achieve or maintain positive self-esteem by positively differentiating their in-group from a comparison outgroup" (Cornelissen, Haslam and Balmer, 2007; Gaertner et al., 1990; Perdue et al., 1990). Tajfel and Turner (1979) posited that groups internalised with an intended positive impact on a member's sense of self. They describe SIT as "categorization in terms of a group membership, and having defined themselves in terms of that social categorisation, individuals seek to achieve or maintain positive self-esteem by positively differentiating their in-group from a comparison outgroup" (Cornelissen et al., 2007).

The self-categorisation theory coined by Turner-Zwinkels et al. (2015) was viewed as complimentary to SIT, which explained social identity as a process in the broader domain of identity. This approach posited that individuals developed a social identity (element) through a

process of self-categorisation. This process-involved individuals evaluating accessibility to a group, with groups checking the individual's readiness and fit in relation to group identity and whether or not to allow or decline membership. An individual's personality, status and opportunity were major factors determining accessibility to groups (Turner-Zwinkels et al., 2015).

Schwartz et al. (2012) define social identity as the way people identify themselves within groups, how they create meaning for these groups to which they have a sense of belonging, and the feelings and attitudes that manifest within a person from identifying with such a group. This form of group-driven evaluation of readiness and fit is debatable as it renders biasness and discrimination as possible consequences of the process of self-categorisation (Huynh, Nguyen and Benet-Martinez, 2011). Further to this, reference is made to the high levels of social identity derived from this fit, which allows the adoption of group philosophy (norms and teachings, etc.) that influences the individual's behaviour in differing contexts where some identities become salient and others move to the periphery (Miramontez, Benet-Martinez and Nguyen, 2008; Richard and Grimes, 1996).

What becomes evident in identity studies as time progresses is the absorption of social categorisation into management studies as a means of understanding identities within an organisation (Acker, 1998; Booysen, 2018; Brannen and Thomas, 2010). Alvesson et al. (2008) identified three broad theoretical perspectives for understanding identity in an organizational setting. *Social identity* (the creation of identity – "Who am I?" – Personal Identity), *Identity construction* (how it is shaped and reshaped: "Who am I in relation to others? How do they contribute to the changing me?" – Relational Identity), and *Identity regulation* (how identity can

be controlled and affected by various organizational aspects: “How do they expect me to act /behave?” – Collective Identity).

Michael Gill depicts the notion of the “elite identity” and the identity work/construction (to achieve this elite identity) that an individual must endure as changing situations make social identities fluid and not fixed. Identity work refers to the ongoing shaping of a personal self-identity, in the context of other people, cultures and discourses. It therefore involves the connection of external social identities to internal self-identity (Carrim and Nkomo, 2016; Gill, 2015). Ashforth and Mael’s introduction of SIT informed much, if not all, of the work of scholars such as Haslam (2005, 2007, 2011). These studies are informative in providing understanding of identity in relation to organizational goals.

Literature on organizational socialization posits that situational and self-definitions emerge through symbolic interactions – meaning is not a given, but evolves from the verbal and nonverbal interactions of individuals (Ashforth and Mael, 1989). Catherine Harnois stated that individuals who have multiple minority statuses often experience mistreatment stemming from multiple, interconnected systems of inequality (Harnois, 2015a). In the case of Black and other minority women, socialisation and identity build start from home and extend to the workplace.

Scholars from various disciplines such as psychology, anthropology and sociology have each contributed their understanding of this concept of self, and central to all their discussions is the importance of the individual as the navigator of his/her trajectory (Alvesson et al., 2008). Although this is agreeable, it is necessary to emphasise the importance of choice and the voice

(free will) that the individual employs to determine which identity is salient while navigating their life trajectory, as identities are many and not just one. To understand identity, one must delve into the multiple identities of the individual that came to be over time, with an underlying appreciation of their intersectional nature.

2.2.2 Intersectionality, Race and Gender.

This section will begin with an overview of intersectionality, followed by an overview of race and gender. Finally, the intersection of race and gender in the organisation will be discussed.

2.2.2.1 Intersectionality.

The intersectional approach to the understanding of identity issues of minority women by Crenshaw (1991) provided a realistic framework within which minorities could be explored without subordinating one identity at the expense of another. Her work postulated that identities could not be understood as standalones, but as interlinked versions of one's self that are formed and function within systems/structures of oppression. Crenshaw's work deeply articulates the complex nature of social association in relation to intersecting identities and the various levels of oppression that unfold for African American women in this category.

Crenshaw's study explored the marginalisation of Black women in the United States employment sector and looked at the interplay of multiple identities (that is, being Black, a woman and her economic standpoint, or class), and how each of these identities depends on the others for meaning, as well as how they reflect the diverse system of oppression they face. The notorious description of *intersectionality* by Crenshaw (1991) depicted it 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. An ethnic minority woman experiences 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…*

This description emphasises the interlocking relationship between each identity construct in creating a meaning of *self* and the crossroads this self must encounter at every turn (Yuval-Davis, 2006).

Crenshaw (1989) stated that when contrasting the nature of discrimination, if one looks at all women, discrimination against a White female is considered to be a standard sex discrimination claim, while claims that diverge from this standard appear to present some sort of hybrid claim. This powerful statement emphasised the level of power that one racial grouping had over the other and reinforced the hierarchical categorisation of racial groupings and how this related to their location, agency and opportunity (Boswell, 2017). The South African apartheid regime is one such example of an "inequality regime" that harnessed racially driven structures of oppression (Canham, 2017; Canham and Maier, 2018; Jolaosho, 2017). These structures created social disparities and inequalities that remain evident today in relation to race, gender and class. Tables 1.3 and 1.4 presented earlier in this document bear testament to the skewed picture society paints of itself – a picture that exudes inequality and silently pervading systems of oppression, promoting a very unequal society.

The term *intersectionality* has since claimed much popularity and has informed and shaped many studies on identity (Yuval-Davis, 2006; Shields, 2008; Carrim, 2012, 2016; Carrim and Nkomo,

2016; Booysen, 2016; Wong, Liu and Klann, 2017). Intersectionality theory argues that individuals who have multiple minority statuses often experience mistreatment stemming from multiple, interconnected systems of inequality (Harnois, 2015a). The term addresses how multiple interlocking social identities reflect diverse systems of power, privilege, oppression and inequity (Wong et al., 2017, p. 261).

2.2.2.2 Identity Tags of Race and Gender.

To understand the creation of gendered organisations, the developmental histories that deepened the racial and gendered disparities must be explored. These identities—especially for women—cut deeper in terms of the suffocation and oppressions they endure in the home and the workspace.

Race and gender patterns are not just shards of history, but are continually created and re-created in today's organisations, as people are hired, promoted, or fired, as wages are set, and as managers, supervisors and workers organise and execute their daily tasks (Acker, 2000, p. 198).

Acker (1990) refers to the United States and its history within the social context of slavery and the effects on people from differing racial groupings that exacerbated racial and class-linked discrimination (Nagel, 1994; Acker, 1990, 2000, 2006; Levant, Wong and Klann, 2017). These historical episodes, according to Acker (2006), give birth to unequal societies. Inequality in organisations is described as systematic disparities between participants in power and control over goals, resources, and outcomes; workplace decisions such as how to organise work; opportunities for promotion and interesting work; security in employment and benefits; pay and other monetary

rewards; respect; and pleasures in work and work relations (Acker, 2006; Bell et al., 2003; Boswell, 2017).

A woman's ascribed categorisation, born out of power differences through inequality regimes, was first racially driven, then gender-driven. In many societies, White males were dominant in relation to White women, Black and other ethnic men, and Black and other ethnic women (Acker, 2006; Canham, 2017; Canham and Maier, 2018; Jolaosho, 2017). Higginbotham (1992) urged Black feminists to emphasise the importance of race as a social category in their analysis of power and its inevitable link to gender and class-related problems.

Higginbotham (1992) presented the explication of race in three inter-related pockets of understanding:

> *First of all, we must define the construction and 'technologies' of race as well as those of gender and sexuality. Second, we must expose the role of race as a metalanguage by calling attention to its powerful, all-encompassing effect on the construction and representation of other social and power relations, namely, gender, class, and sexuality. Third, we must recognise race as providing sites of dialogic exchange and contestation, since race has constituted a discursive tool for both oppression* (p. 252).

So, how did race come to be?

Identity Tag – Race

Race is a representation of the master/slave relation, cloaked by class. Slaves were seen as "property"' as well as a social class that was exploited under a system premised on White rule, advocating the ownership of Black bodies and Black labour (Higginbotham, 1992; Smedley and

Smedley, 2005). Construction of race was prevalent in the "ideological state apparatuses" that were race-, class- and gender-driven. These apparatuses shaped and reinforced stigma that would soil perceptions as generations passed, thus sustaining a vicious circle of oppressive rule. Racial identity was confirmed by various superimposed methods such as, for example, in the United States, "the one drop rule" where shared ancestry determined your racial classification, or "the pencil test" in South Africa, which involved sliding a pen or pencil through the hair of a person whose racial category was indiscernible (Higginbotham, 1992; Smedley and Smedley, 2005; Meadows and Tapia, 2011; Canham, 2017; Canham and Maier, 2018; Jolaosho, 2017).

With the implementation of racially oppressive laws and other "methods" of racial categorisation, came the infiltration of norms or stigmas of acceptance into all facets of life. Whether in the education system or social media, the chain of events it triggered was inevitable, resulting in what is seen today as an extremely unequal society where there is constant sensitivity to racial identity. Higginbotham (1992) states that this applies in

> *[S]ocieties where racial demarcation is endemic to their sociocultural fabric and heritage to their laws and economy, to their institutionalized structures and discourses, and to their epistemologies and everyday customs-gender identity is inextricably linked to and even by determined by racial identity* (p. 254).

This statement is significant given that women were for the most part seen as a homogenous social class. However, race and its social attachments shade every woman differently with varying experiences.

Identity Tag – Gender

For decades, women all over the world have been questioning and confronting their conventional identities and striving to establish more equal and self-determined ways of reinforcing their gender, free of bias and stereotyping tendencies (Bennett, 2006; Magaziner, 2011; Jenkins, 2014; Schamader and Block, 2017; Mayer, Surtee and Mahadevan, 2018). This has been attributed to the practice of male dominance perpetuated by cultural norms, and beliefs rooted in systems of patriarchy and filtered through social and organisational institutions (Acker, 1989; Bullough et al., 2017; Booysen and Nkomo, 2010; Levant, Wong and Klann, 2017). Their oppression is evident, given they must either assimilate, categorise or alternate their identity to fit into a context that is very different from their own, laden with ideologies that do not favour their presence (Meer, 1972; Bell, 1990; Govinden, 2008; Vahed and Desai, 2010; Carrim, 2012; Jaga et al., 2018).

Even though women are coming to the fore, especially in the world of work, research has indicated a growing trend of women occupying positions that place them under more scrutiny, so that owing to the precarious nature of the position, the glass ceiling now becomes the glass cliff (Ryan and Haslam, 2005, 2011). Hence, they perceive higher levels of gender inequality, gender discrimination and sexual harassment. In addition, younger, highly educated women tend to have a strong awareness of gendered inequality (Harnois, 2015b). This is perhaps the greatest hurdle that women must face in terms of gender stereotyping, more so when such bias frequently becomes unconscious, thus becoming difficult to address (Bullough et al., 2017, p. 212).

According to Acker, 1990: “Abstract jobs and hierarchies, common concepts in organizational thinking, assume a disembodied and universal worker. This worker is actually a man; men's

bodies, sexuality, and relationships to procreation and paid work are subsumed in the image of the worker" (p. 139). Images of men and masculinity pervade organizational processes, marginalizing women and contributing to the maintenance of gender segregation in organisations" (Acker, 1990, p. 139).

According to Acker (1990) gendered processes mean "advantages and disadvantages, exploitation and control, actions and emotions, meaning and identity are patterned through, and in terms of, distinctions between male and female, masculine and feminine" (p. 146). The formation of the gendered organisation, as described by Acker (1990), occurs through four processes:

- Process 1 – Division of labour, based on gender, hierarchy and power;
- Process 2 – Creation of symbols, images and forms of consciousness that explain, justify or oppose the gendered divisions;
- Process 3 – Interactions between women and men, women and women, men and men, which enact dominance and subordination, and create alliances and exclusions; and
- Process 4 – The internal mental work of individuals as they consciously construct their understanding of the organisation's gendered structure of work and opportunities and the demands for gender-appropriate behaviour and attitudes. This means creating the personae or gendered professional identity (Acker, 1989; Acker, 1992; Kvande and Rasmussen, 1994).

When women enter environments that are dominated by men, a sense of discomfort arising from what has been identified as the norm places existing perceptions of gender ideology—that is, male dominance—under threat (Acker, 1989; Levant, Wong and Klann, 2017). Studies as early as 1975 focus on the perceived differences of female middle manager characteristics in comparison to their

male counterparts, and it was posited that perceptions of what it meant to be a successful middle manager related to characteristics generally displayed by men as opposed to women – the "think manager, think male" bias (Schein et al., 1996). This bias is evident in research that pointed to the reluctance of staff to accept a female supervisor and male managers not being convinced a female leader was effective (Ryan and Haslam, 2005).

According to Ryan and Haslam (2011), women are faced with a dilemma: Should they conform to a female stereotype, thus making them "not good respondents", or should they adopt a leader stereotype and not be considered "proper" women? With more women now engaging in the workplace, the numbers of mentors and role models are on the rise for women who are new to the world of work (Mavin, 2006; Hewlett, 2008). The former are those who would motivate and develop the latter on ways of manoeuvring and short-cutting the long, stressful road to success that the former had endured (Mavin, 2006). However, the juxtaposition presented by labelling women in senior management as mentors, with an assumed expectation of their female solidarity, raises interesting scenarios of women who do not strongly identify with their female identity. Research has revealed female misogyny among senior women in management and, related to that, the "queen bee syndrome", a consequence of the gender discrimination women face in the workplace (Derks, 2010).

Mathur-Helm and Johnson (2011) presented evidence of women in senior positions in South Africa who sought recognition of their own abilities and talents, as opposed to being representatives of the interests of other women. Their sample in general felt that in order to survive in a corporate world, women had to become like men, join the old boys' club and be "one of the boys" (Mathur-

Helm and Johnson, 2011). Linked to this, Davidson and Cooper (1992) attribute such behaviour to fear of competition in an environment that offers limited opportunities for women. From the above, it is clear that gender roles significantly influence work culture and management roles. This in turn widens discriminatory practices in an organisation where masculine ideology pervades institutional structures, processes, and women's perceived roles contradict and complicate their presence.

Group memberships, based on a woman's race and gender identity, inform ways or methods she employs to organise her personal and professional life spheres. Entering a world that undermines women brings with it an array of challenges. Women in STEM roles are expected to conform to the ideologies of the organisation. These ideologies have been mostly male-orientated, resulting in a socio-cultural dilemma faced more by ethnic women than by White females (Canham, 2017; Canham and Maier, 2018; Barnes, 2017). The dedication of time and effort to work demanded of these women resulted in behaviour that their traditional roles had labelled as deviant. This placed them in a situation where they were caught between differing ideologies that placed their intersecting identities under duress to either conform or rebel.

Booysen and Nkomo (2010) posit that gender identity is interwoven with, and embedded in, racial identity. They go further to state that every person has a core identity governed by two areas, race and gender, and that this identity is shaped and reshaped by a person's social interactions and social institutions. Post-apartheid, the struggle for women's rights was based on racial and gender oppression, however the focal point for the country was to rectify the legacies of racial oppression,

and gender was seen as being dealt with by considering gender struggles within the broader domain of race (Albertyn, 1994).

This gave rise to the notion of "gender apartheid" being so entrenched into the "social and legal fabric of majority of cultures that it at some point is seen as normal" (Qureshi, 2014, p. 95). De la Rey (1997) makes reference to the construct of "triple oppression"; a phenomenon experienced by women of colour as layers of discrimination – not only from males of the other race, but from their own, as well as from women who technically could be referred to as their "in group" in terms of gender but their "out group" in terms of race (Burke, 2004). There is nothing natural or self-evident about concern with who we are; preoccupation with identity is a cultural, historical formation (Andrews, 1998; Alvesson et al., 2008).

South Africa's diverse population is shaped by differing cultural and ethnic backgrounds, most of which are founded on a patriarchal ideology. The vice chancellor of the University of Cape Town, Professor Mamokgethi Phakeng, states that Black women are affected by assertions of Africanness—a strong feature of contemporary politics—because their promotion of pristine forms of African culture generally valorises patriarchal practices (Phakeng, 2015). This is class-based, race-based and gender-based, with the latter exacerbated by cultural norms and ideologies favouring patriarchy (Phakeng, 2015). It is worth noting that a growing number of Black women in South Africa have rejected their traditional familial roles, aspiring to financial independence and individual career success (Jaga et al., 2018). However, this is not sufficiently convincing to prove that equity, in terms of gender, is progressing. Statistics presented in Tables 1.3 and 1.4

above reflect the skewed representation of men and women in the workplace, showing a high representation of men, mostly White.

The narratives of South African Indian women, according to Carrim and Nkomo (2016), reflect how these women in managerial positions engage in "identity work" to manage the intersections of multiple social identities. Managing these identities has to be done in a social context that still presents racism, patriarchy, the masculine notion of the ideal organisational manager as well as deeply embedded cultural prescriptions of what an Indian woman ought to be and how she should behave in society and in organisations (Radhakrishnan, 2005; Vahed and Desai, 2010; Carrim and Nkomo, 2016). For Indian women, imposed cultural inhibitions can be traced back to the days of indenture, and before, stemming from the land of their ancestry, India (Meer, 1972; Jaga et al., 2018).

Traditions developed and grew to become the doctrine on which socialisation was premised. Over generations, this doctrine was adopted as the definition of what it meant to be Indian. It involved propagating the patriarchal family value system, and so triggering gender response sets that would have women believe in their subordination to men (Meer, 1972; Bharuthram and de Kadt, 2003; Khan, 2012; Ahmed and Carrim, 2016; Carrim, 2016; Jaga et al., 2018). Gender oppression—based on culturally informed gender roles—was further exacerbated by the oppressive system of apartheid segregating women into the space of marginality, now on the basis of not only gender, but race as well (Meer, 1972; Ahmed and Carrim, 2016; Carrim, 2016; Jaga et al., 2018).

This “double consciousness” is the very essence that informs the cognitive processes of these women and the related challenges they face to break the cycle of intersecting oppressions (Du Bois, 1969; Crenshaw, 1991). It is accepted that cultural values and traditions can influence attitudes and behaviours (Littrell and Nkomo, 2005). Feminists, feminist anthropologists and Black feminists (Bullough et al., 2017; Booysen and Nkomo, 2010) have researched culture, and its role in the development of women.

Research indicates that gender stereotyping affects perceptions (Littrell and Nkomo, 2005). According to Littrell and Nkomo (2005), culture also defines gender roles. In all cultures, biological sex is not the only factor to define being male or being female. Societal values and expectations perpetuate gender role stereotypes in a culture, and depict males as being “masculine” and females as “feminine”. According to Littrell and Nkomo (2005): “Stereotypes of gender roles created by a culture govern our way of life throughout our existence. These stereotypes vary among different cultures, as well as among different ethnic groups” (p. 563). Where then does this place Black, Coloured or Asian South African women who embark on male-dominated professions?

A common thread through all the literature examining identity and the intersectional identities of ethnic women was the relevance of history, location and agency as foundations upon which categorization and classification came to be. The consensus of all researchers was that identity was not something one was born with: instead, it was socially constructed. Possession of an identity was only of importance if associated with the social assumptions based on the dominant cultural ideology within that location or context. If it was one that reflected difference, then that

identity was deemed lesser, or of no meaning to society, and individuals in that group were treated accordingly.

The current study draws on the literature on identity reviewed thus far to guide understanding of a South African Indian woman's construal of her identity as it informs her bicultural context. To achieve this, it is essential to explore her historical, contextual parameters (Richter, 1990). Understanding her contexts requires understanding her perception of herself, based on her lived experiences in relation to her identities.

To achieve opportunity—even from a marginal space in the dominant's world—meant a transformation of the profound question from "Who am I and what is my purpose?" to "Who must I become in order to have a purpose?" So begins the journey of a bicultural.

2.2.3 Biculturalism.

To enable an understanding of biculturalism, a meaningful point of departure would be through the term coined by Du Bois more than a century ago: *double-consciousness* (Du Bois, 1969). This describes both the external world and the internal, intrapsychic dynamics that resulted from living in an oppressive society (Du Bois, 1969); living in a world as an identity aware of its own history, a history that relegates it to the perceived oppressed identity of "other" (as categorised by the dominant group). This is the bicultural space – one person navigating through two different worlds, each housing its own systems of oppression (Bell, 1990; LaFromboise, Coleman and Gerton, 1993; Benet-Martinez et al., 2002; Benet-Martínez, Lee and Leu, 2006).

Culture comes in different forms. Apart from the more common categories of ethnicity and nationality, it may include region, religion and social class (Cohen, 2009). Therefore, with the advent of globalisation, the movement of people across the globe in search of opportunities inevitably led to the mixing of cultures. This occurred not only between groups of people belonging to different cultures, but also among individuals. Bicultural, or people who are part of two cultures, are a growing population that has been studied in recent years, yet, there is still much to learn about exactly how their unique experiences of negotiating their cultures affect the way they think and behave (LaFromboise, Coleman and Gerton, 1993; Benet-Martinez et al., 2002; Benet-Martinez, Lee and Leu, 2006; Brannen and Thomas, 2010; West et al., 2017).

Triandis (1989) outlines the three aspects of self—personal, private and collective—and three dimensions of cultural variation (individualism-collectivism, tightness-looseness and cultural complexity) in response to the self. Triandis (1989) concluded that cultural homogeneity led to tightness and a focus on the collective self rather than the private and public self. Individualistic cultural dimensions resulted in sampling more of the private and public self and less of the collective self. The dimensions of cultural variation and its connection to aspects of the self are significant when it comes to understanding why people behave or navigate differently when in a specific cultural context. Cultural tightness-looseness and individualism-collectivism depend on which context the self finds itself in and determine the individual's response and experience.

Biculturalism was originally derived from the literature dealing with acculturation and focused specifically on cultural behaviours such as language use, choice of friends and media preferences (Schwartz and Unger, 2010, p. 27). Acculturation theorists went further by stating that it involves

synthesising the heritage and receiving cultures into a unique and personalised blend (Schwartz and Unger, 2010; West et al., 2017). From this perspective, the bicultural individual selects aspects from both the heritage and receiving cultures and integrates them into an individualised "culture" that is not directly reducible to either the heritage or the received cultural streams (Schwartz and Unger, 2010).

Acculturation literature mentions many mechanisms that individuals adopt when in a bicultural space. Additive theory and acculturation research on biculturalism list two factors that led to biculturalism's emergence. One refers to a space where both heritage and the receiving culture are each valued and emphasised. The second alludes to the process of socialisation by parents to ensure children are orientated more towards their heritage culture (Schwartz and Unger, 2010). Biculturals engage and react differently—cognitively and behaviourally—to the same cultural context. Some may find assimilation to the receiving culture an easy transition while others, in contrast, may shy away from that culture by presenting actions and thoughts that counter the salience of the receiving culture (Benet-Martínez et al., 2002).

This cognitive and behavioural difference is partly driven by individual differences in bicultural identity integration (BII), referring to bicultural' understanding of how their two cultural identities relate (Benet-Martínez and Haritatos, 2005). Bicultural who present with high BII perceive their cultural identities as compatible and overlapping, while those with low BII see their identities as conflicting and separated (Benet-Martínez and Haritatos, 2005). Bicultural can differ in BII despite strongly identifying with each of their cultures, depending on how they manage the two together (Benet-Martínez et al., 2002). The coupling of inequality regimes, and the socialisation

processes happening within these regimes, lead to categorisation through the formulation of hierarchies and ranking, which proliferate not only by gender, but also race, leading to a "double jeopardy" situation endured by ethnic women (Barnes, 2017).

Being a woman is one matter, but being a woman of colour opens women to further restrictions in breaking through the proverbial glass ceiling. Black Coloured or Asian women who have been oppressed because of their many constructed identities carry the burden of complex construal about self – something that women of privilege do not experience (Sanchez-Hucles & Davis, 2010). In response to this, Gordon (2018) refers to the racially dominant assuming a self-justified reality, with the less-dominant lacking justification and their access to "being" seen as illegitimate. Hooks (1989) speaks about the bicultural phenomenon when she refers to the radical openness of the "margin" space.

This margin space alludes to a person being on the boundary of two different locations, each with their own sets of cultural ideologies and systems of oppression. A person who occupies space on this boundary is therefore termed as being in a space of marginality. "Understanding marginality as position and place of resistance is crucial for oppressed, exploited, colonized people" (Hooks, 1989, p. 21). With the likes of colonialism, apartheid and other oppressive systems, the salient culture most often is one premised on Western ideologies, forcing those who hail from the Eastern parts of the world to become the bicultural who must find ways of navigating this "otherness" in two differing contexts.

In their work on biculturalism, Bell (1990) and Denton (1990) focused on the bicultural stress experienced by Black American women and how they perceive themselves as living in two different contexts, one White and the other Black. They discuss the act of mainstreaming and the individual decision to assimilate (adhere to the dominant culture and renounce their own) or compartmentalise (establish rigid boundaries between Black and White contexts and shuttle between the two different worlds). Bell (1990) stated that forming a bicultural life structure leads one to a position of marginality. "A *marginal person* is one who lives on the boundaries of two distinct cultures, one being more powerful than the other, but who does not have the ancestry, belief system, or social skills to be fully a member of the dominant cultural group" (Bell, 1990, p. 463).

In her study of the experiences of career-orientated Black American women, Bell (1990) introduced what she termed "bicultural stress". *Bicultural stress* makes reference to the anxiety that comes with navigating between two different contexts, or what Ella Bell describes as the emotional and physical disturbances caused by a person's bicultural existence (Bell, 1990; Orlando and Graimes, 1996). In Bell's study, the two contexts referred to an African American women perceiving her bicultural life as one that saw her function in both a White world and a Black world (Bell, 1990), being in the margins of two very different worlds, each with its own set of ideologies that emitted a push-and-pull effect and created tension between identities within an individual.

According to Sanchez-Hucles and Davis (2010) women can achieve senior positions by "carefully traversing complex paths as they confront issues associated with child care needs, racism, sexism, and discrimination on the basis of identity" (p. 172). This complex path is at the heart of the

anatomy of the bicultural space. For this study, the contexts to which Bell makes reference are adopted, but by referring to them from the socio-cognitive perspective of the intended respondents and their social and organisational contexts.

LaFromboise et al. (1993) concentrated on the *alternation model*, an alternate response mechanism to that of assimilation and compartmentalisation, which posits that an individual is able to gain competence in two cultures without losing sight of his/her own or having to choose between the two. Orlando and Graimes (1996) expounded on inter-role conflict caused by the demands of a bicultural existence, advocating adoption of the alternation model as opposed to assimilation and categorisation, as a means of reducing bicultural stress. They also refer to a model of multiculturalism, stating that if the dominant can bring their culture to work, then the minority should do so as well (Orlando and Graimes, 1996). Virtuous as this may sound, it could be labelled a utopian perspective of what a workplace might look like.

Dasgupta (1998) describes a similar approach through "judicious biculturalism" – the choice made by an Asian Indian community, mainly comprising Hindus, in the United States, who controlled their own acculturation process. Barrios and Egan (2002) expanded on the acculturation process among indigenous native people in America and noted that identifying with both the dominant and one's own culture can create bicultural tension that may be detrimental when someone internalises the dominant society's negative attributions of that person's own culture. This contradiction of cultures contextualises the research by Bell and Nkomo (1998) on African American women and a process called *"armouring"*, a socialisation process in which their mothers taught young Black girls how to protect themselves in both the White and Black cultural contexts.

The study by Barrett et al. (2003), dealing with the skills shown by Black human resource developers in managing their bicultural stress, posited that racial prejudice and discrimination had made these Black individuals outsiders within a traditional organisation. Benet-Martinez et al. (2002) analysed and developed the bicultural identity integration of Chinese Americans who showed both low- and high-level integration and the associated sampling of self or the collective. This study indicated that individual differences in bicultural identities affect the use of cultural knowledge to interpret social events (Benet-Martinez et al., 2002). Studies by Bell (2006, 2009) and Padilla (2006) relate to immigrants to New Zealand (Pākehā settlers) and the United States (Latino) respectively, covering contradictions in terms of the rhetoric of equality and the reality of inequality, the bicultural dilemmas they face and the bicultural methods they employ to survive in a highly racialised society.

Inman et al. (2007) investigated the enculturation and acculturation process of 16 first-generation immigrant Asian Indian mothers and fathers in America and the impact of this process on the second generation (their children). The data the researchers cited indicates that these immigrant parents engaged in thought-provoking processes of negotiating conflicting cultural demands: at the same time, this encouraged their propagation of traditional identities for adoption by their offspring (Inman et al., 2007). Immigration of course presents its own set of problems. The respondents stated they experienced "significant loss in the form of familial guidance, cultural continuity, and environmental support" and this seemed to significantly influence their choices about maintaining and negotiating their own cultural identities (Inman et al., 2007, p. 98).

Attempts by immigrants to maintain ethnic identity are further depicted by Stroink and Lalonde (2009) who use social identity theory as a framework to comprehend bicultural conflict in second-generation Asian Indians settled in Canada. Stroink and Lalonde (2009) posited that those who construed the two cultures as being different presented lower levels of identification with both cultures. As a process, acculturation almost promotes the notion of two cultures between which an individual shuttles or navigates. The reality, though, is that with migration and the results of post-colonialism, a person may have identities within identities and contexts within contexts. For example, a woman may have parents with lineage extending to an Asian Indian mother who is second-generation American and a White father who is second-generation Croatian. The individual's place of birth is Kenya. This individual will thus not merely sport a bicultural existence, but one that has multiple tags to help define who she is or chooses to be.

Thomas et al. (2010) raise this notion of multiplicity when they state that cultural identities may be uniquely represented within each multicultural individual and that acculturation is but one mechanism through which individuals are confronted with the task of defining themselves in terms of their culture. This is reinforced by Acevedo-Polakovich et al. (2014) and Rudolph et al. (2015) who refer to the notion of adaptability to many cultures and not just a divide between two. West et al. (2017) refer to multiculturalism but state that focus on a bicultural way is a much more simplistic way of understanding something that is very complex. The main construct that underlines this word *biculturalism* is identity. One individual with multiple identities functions in two very different spaces and the impact of these identities on these spaces—i.e. how do these spaces inform identity and vice versa—is the crux in understanding the unique interplay between identity and these two contexts. Understanding identities must be done in concert with the contexts

from which they are born, socialised, shaped and reshaped. The following is a brief understanding of the two contexts and how they apply to the current sample for this study.

2.2.3.1 Personal context of a South African Indian Woman.

Hooks (1989) states that "the struggle may not even begin with the coloniser; it may begin within one's segregated colonized community and family" (p. 20). Black professional women manage expectations, values and roles in relation to the Black community – a community with its own norms regarding the status of women. On the community level, they are expected to be representational spokespersons. On the personal level, Black women need to build supportive and caring relationships with their families and significant others (Bell, 1990). These expectations are similar to those Indian women must meet and which stem from historical stereotyping as Indian women in South Africa. The social context refers to the individual and her identity within her heritage, cultural context and perceived stereotypical role/s and expectations thereof. At this juncture, it is important that the history of Indian settlers be briefly explained to contextualise the then and now of the Indian diaspora in their current locations, as this study focuses on the bicultural lives of women whose lineage derives from this diaspora (South African History Online, 2020).

It is recorded that 16 300 Indians were shipped to the Cape as slaves during the Dutch colonial era starting in 1684 (South African History Online, 2020). Indentured labourers brought by the British to Natal from colonised India, starting in 1860, followed this first cohort. On 16th November 1860, 341 people aboard the SS Truro came from Madras to work on the Natal sugar cane plantations. Categorised as "*coolies*", they were bound by contracts (*Girmit*) to work the land for a menial wage for a specific time, but under extremely inhumane conditions (Govinden, 2008). Ten years

later, a second batch of Indians, who had paid their own fares, arrived in Natal Colony to set up businesses. They were categorised as *passenger* or *free Indians*. They were allowed entrance into Natal to set up their businesses to serve the demands of their indentured counterparts. These Indians were mostly from Muslim and Gujarati backgrounds and were much more privileged because of their economic standing (Carrim, 2012). However, they were still considered second-class subjects and not fully immune to the oppressive laws then in force. The arrival of these indentured and passenger Indians did not change Indian males' perceptions of what it meant to be an Indian woman. This was mainly due to the religious doctrines that informed the cultural ideology dictating family dynamics of the Indian home (Meer, 1972; Jaga et al., 2018).

The main driver was patriarchy, within which all rules of engagement were formulated. Colonialism exacerbated this framework through the rules and laws affecting people of colour and particularly "non-White" women. Examples of this included laws governing an Indian woman's entrance into the workspace – this was dependent on the *domicile status* of her husband. Another, emphasising the gender suffocation to which women were exposed, proclaimed that women and children under the age of 10 years were to receive just half of the adult male ration (Govinden, 2008). Such laws exacerbated a traditional system that was already at work in the homes of this minority, one that resonates today when it comes to career choices and the development of women who have been raised in male-dominated homes, governed by male-centred ideology.

Faced by such suppression, how does a woman adopt a cognitive process mechanism that prepares her for a workplace where gender roles differ from those to which she is accustomed? Discrimination against Indian women was not something new, as evidenced in the diaspora to

Trinidad and Tobago from 1849 to 1917. These women were categorised as "*not abled bodies*", and depicted as financial disabilities to their colonial masters, owing to the risk of child-bearing and child-rearing (Reddock, 1985). They experienced gender-based violence from Indian males who wanted docile and controllable spouses, characteristics linked to the religious Brahmin Sanskrit doctrines, which gave rise to caste systems and patriarchal practices (Reddock, 1985). The Mauritian experience presented much of the same "women problems". Indian women were seen in a role that one could only term as a paradoxical dichotomy, perceived as being both nurturers and destroyers. They were nurturers in their role as mothers, but if a female child was born, it was an ill-fated birth, which denominated her as a financial burden on her family, from the belief that she would never be able to provide economically for the family (Thanacoody et al., 2006). This belief was one that cut deep into the psyche of women regarding their role and their self-worth, and further entrenched patriarchal dominance (Khan, 2012).

The indentured experience of Indian women in South Africa was no different to those in Trinidad or Mauritius, in terms of the problems these women experienced at the hands of colonialist men, colonialist women, and men and women from their own ethnic community (Meer, 1972; Govinden, 2008; Carrim, 2012; Jaga et al., 2018). Women were relegated to a subordinate status through a religion-embedded, culturally-driven ideology further exacerbated by the colonial and apartheid eras (Meer, 1972; Govinden, 2008; Carrim, 2012; Jaga et al., 2018). The diaspora may have involved a change in locations, from colonised India to colonised Natal, but for these women, strict adherence to cultural norms never wavered. A woman was still seen as a minor, dependent on the men who were and would be in her life at some point, from father, to brother, upon marriage to husband, and as a widow to her son (Meer, 1972; Carrim, 2012). Their roles as mothers, wives,

daughters and daughter-in-laws inform their relevance in their community (Meer, 1972). However, speaking their mind or following their ambitions was seen as a contravention of the "rules" governing traditional patriarchal norms and values. Indian women had one purpose in the many identities they sported: the role of silence, subordination and marginalisation (Carrim, 2012; Govinden, 2008).

With the end of apartheid and the proverbial "glass ceiling" being shattered, ethnic minority women were now able to access opportunities in the workspace. However, the race and gender hierarchy still existed there, with White males dominating top and senior managerial positions, particularly in the private sector (Carrim, 2012). The Employment Equity Act No. 55 (1998) opened the gate to opportunities for women. Interpretation and implementation presented challenges as organisations tended to lean more towards racial equity than gender equity. In the case of women, gender challenges prevail even now, more than two decades after the Equity Bill was passed, and this can only be attributed to historic gender practices, based on male dominion (Hewlett, 2008; Booysen and Nkomo, 2010; Carrim and Nkomo, 2016).

2.2.3.2 Professional Context – the Engineering Space.

This context refers to a place of work or specific profession and its related organisation, in this case, engineering. Gill (2015) alludes to the notion of the "elite identity" and the identity work/ construction (to achieve that elite identity**)** being those an individual must endure, as changing situations make social identities fluid rather than fixed; while identity work is on-going, shaping personal self-identity in the context of other people, cultures and discourses. It involves the connection of external social identities to internal self-identity (Gill, 2015) and begs the question about "who I am" coupled with "who I have to become". Academic literature dealing with

organisational socialisation posits that situational and self-definitions emerge through symbolic interactions – meaning is not a given but evolves from the verbal and non-verbal interactions of individuals (Ashforth and Mael, 1989).

Interactions are premised on societal perceptions of what society deems an individual to be, based on social associations attached to a person's race, gender and other identities. Kur and Bunning (1996) state that choices between organisational-worthy goals, and personal-worthy goals, are critical decision-making moments. These decision-making moments are crucial to mobility within an organisation. Harnois (2015a) argues that individuals who have multiple minority statuses often experience mistreatment that stems from multiple interconnected systems of inequality. In the case of Black and other minority women, this starts in a patriarchal home and extends to the workplace dominated and monopolised by androcentric norms and values (Harnois, 2015a).

2.2.3.3. South African Indian Women in STEM.

Historically, women faced controlled options for educational opportunities and social positioning owing to their stereotyped roles that were associated with the responsibilities of family and community development (Mama, 2003). The stereotypes associated with what femininity and masculinity meant in society influenced attitudes toward women in STEM (King Miller, 2017). The experience of the South African Indian woman as a minority member is deeply entrenched within systems of oppression, based on androcentric European ideologies (colonialism and apartheid), further exacerbated by the ideologies of her own diaspora and her post-apartheid challenges (Govinden, 2008). This makes her experiences unique and reflects the reality of her having to occupy many identities simultaneously. A Black woman's experience may share some similarities to that of an Indian woman, but history and culture bring differentiation. Hence, she

cannot simply be understood by being categorised as part of a homogenous group of minority women. The presence of South African Indian women in STEM professions indicates more flexibility for entry into spaces that have historically been dominated by men.

However, whether this reflects a trajectory towards changing perceptions around the role of Indian women is still to be determined, given that most Indian women have historically been raised in homes that follow traditional patriarchal ideologies (Acker, 1989; Meer, 1972; Batliwala and Dhanraj, 2004). Their social conditioning has been such that they are led to believe their decision to take on a "male" profession makes them an outlier to their Indian identity. The subjugation they face in their traditional home and community is just one level of oppression that they will experience from being non-conformists to the expectations of their cultural context (Govinden, 2008; Jaga et al., 2018).

Early years of socialisation in their homes, if dominated by patriarchal norms and values, do not prepare them for the world of engineering, which is predicated on male ideology, given it has been a male-dominated profession (Ahmed and Carrim, 2016; Carrim, 2016; Jaga et al., 2018). This opens women up to a second level of oppression, based on the social tags attached to their race, coupled with a gender category that excludes them from an old "all White boys club". *The Athena Factor* study (Hewlett, 2008) raises these very issues that women face in SET cultures with reference to "hard hat" and "macho" cultures. With women in engineering facing such barriers to career development, what then that sustains their motivation and informs the decision of a bicultural woman engineer to remain career-orientated?

This study concerns itself with the lower representation of South African Indian women in a bid to understand what motivates their social cognitive processing those results in decisions to remain in the field of engineering. To understand social cognitive processing and its influence on career orientation, Social Cognitive Career Theory (SCCT) will be reviewed.

2.2.4 Social Cognitive Career Theory (SCCT).

In an age of economic globalisation, the survival of the "career fittest" is on the rise. Career development theoretical perspectives have for some year's populated literature on career guidance and career counselling, focusing mainly on the school and university domains. Five main career theories and their postulations are elucidated below.

Table 2: Five Main Career Theories

Theory	Career Theorist	Postulations	Main Concepts
Theory of Work Adjustment	Dawis and Lofquist (1984)	Views career choice and development as continuing processes of adjustment and accommodation Seeks to explain career development and satisfaction in terms of person-environment correspondence	**Adjustment styles** *Flexibility* *Activeness* *Reactiveness* *Perseverance* *Work adjustment initiated by dissatisfaction* *Person-environment correspondence*
Holland's Theory of Vocational Personality in Work Environment	Holland (1985)	That vocational interest is an expression of one's personality. Like vocational interests, vocational environments could be conceptualised into typologies. People search for environments that allow them to exercise their skills and abilities	*Person-environment congruence* *Differentiation between high- and low-interest profiles*
Self-Concept Theory	Super (1980, 1990) Savikas (1997, 2002)	Career choice and development is essentially a process of developing and implementing a person's self-concept	*Social context* *Socialisation process* *Person and environment* *Life stage development* *Career maturity (adaptability)*
Gottfredson's Theory of Circumscription and Compromise	Gottfredson (1981)	In contrast to the notion that choice is a process of selection, Gottfredson theorised that career choice and development could instead be viewed as a process of elimination or circumscription in which a person progressively eliminates certain occupational alternatives from further consideration	*Cognitive growth and development* *Cognitive proficiency* *Genetic make-up and environment* *Self-concept emergence at different developmental stages.*
Social Cognitive Career Theory (SCCT)	Lent, Brown and Hackett (1994)	Anchored in Bandura's "self-efficacy theory" which postulates a mutually influencing relationship between people and the environment, SCCT theorised that self-efficacy expectations are shaped by four primary information sources	**Four Information Sources** *Performance Accomplishments* *Vicarious learning* *Social persuasion* *Physiological and affective states* *Contextual barriers*

Points of Convergence in Biculturalism and Social Cognitive Career Theory

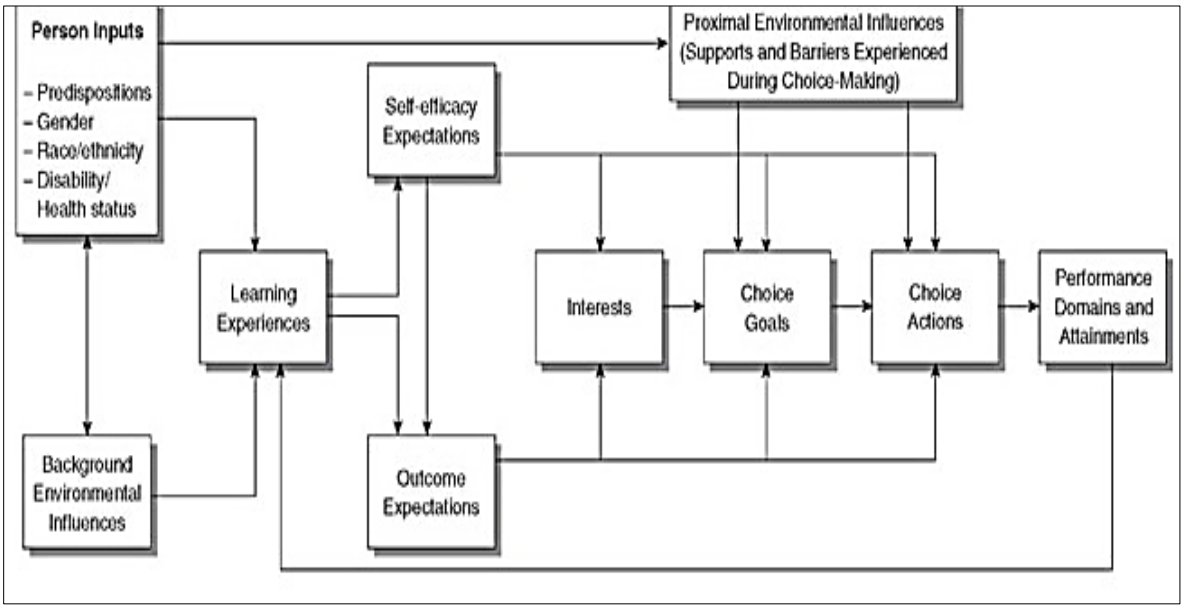
Source: Adapted from Leung (2008).

The theoretical career perspectives presented above in Table 2 were conceived in the United States and present a chronological progression of each theory through its hybridisation into the next (Leung, 2008). Through this progression, the focus shifts from the individual to individual and environment (contextual factors), and from content to process (actual mechanisms triggered within a context). Social Cognitive Career Theory (SCCT) depicts the culmination of the most important concepts of each of the above theories and, when mapped against bicultural theory, points of convergence (coded in red above) render this blend of theoretical perspectives suitable to address the purpose of the current research (Brown and Lent, 2017; Lent, 2013; Lent et al., 2000).

SCCT theory postulates that self-efficacy beliefs and outcome expectations influence individuals' choice of actions by acting indirectly on their interests, choices and goals. Contextual supports and barriers influence the choice-making process at different development stages (Brown and Lent, 2017; Lent, 2013; Lent et al., 2000). The SCCT model has three segments, each focusing on a core variable, namely, *self-efficacy, outcome expectations* and *personal goals*. Self-efficacy is described as a set of beliefs that are linked to particular performance domains and activities (Lent, 2005). SCCT theorised that self-efficacy expectations were formulated through four information sources (learning experiences), namely, personal performance accomplishment (*successful performance of a given behaviour*), vicarious learning (*observation of others performing a behaviour*), social persuasion (*verbal encouragement from others*), and physiological and affective states (*methods of decreasing an individual's emotional state*) (Brown and Lent, 2017; Lent, Brown and Hackett, 2000; Lent, 2006).

These four information sources provide the basis by which social cognitive processing is either positively or negatively affected, with the effects being seen through the levels of self-efficacy and its articulation into outcome expectations, followed by career choice behaviour (Lent et al., 1994; Lent et al., 2000; Lent, 2006; Lent et al., 2008). Below, in Figure 1, do Lent, Brown and Hackett (1994) develop a depiction of the SCCT model? This model will be instrumental in the formulation of the current study's conceptual framework.

Figure 1. SCCT Model



Source: Lent, Brown and Hackett (1994).

The studies cited here are those that pertain to the Social Career Cognitive model reflecting the objective of its application in terms of methodology employed and the significance of its findings in the broader scheme of Social Cognitive Career Theory (SCCT). This information is important, as it will guide how the main concepts of SCCT and the related model will be adopted to explore

the social cognitive processing, levels of self-efficacy, outcome expectations and action behaviour of the selected sample for this study.

Hackett and Betz (1981) stated that women lack strong expectations of self-efficacy in relation to career-related behaviour and this, they posit, is informed by their socialisation experiences which produce a "response set" constricting their consideration of options to traditional roles and occupations: they related this to sex differences in efficacy expectations that were informed by societal influence on role expectation, which were more androcentric in direction. According to SCCT, these learning experiences trigger cognitive processes of self-efficacy, outcome expectations, interest and goals, influencing career development in terms of choices that feed into trends of attrition and retention.

Hackett and Byars (1996) reviewed literature dealing with African American women's career development to clarify how social cognitive mechanisms might be operating. The primary focus of this conceptual analysis was on the central elements of social cognitive theory, namely, self-efficacy and outcome expectations. The study was not based on any empirical data of its own and relied on literature covering SCCT and the career development of African American women (Hackett and Byars, 1996). The study posited that experience and effects of racism go hand in hand with related efficacy and outcome expectancies.

The study by Hackett and Byars (1996) also emphasised the importance of increasing clients' ability to handle a variety of difficult situations, including those involving sexism and racism. Worth highlighting are the contextual factors making this handling ability so unusual, given that

histories are shaped differently, meaning that experiences of racism and sexism as an intertwined dimension must be explored using a lens that appreciates its intersectional nature coupled with its contextual history. This should be considered in terms of the study by Singh, Fouad, Fitzpatrick, Liu, Cappaert and Figuereido (2013) formulating an adapted SCCT model for predicting women engineers' intentions to leave.

Singh et al. (2013) achieved this by integrating concepts from Turnover Theory and SCCT, and used the model on a national sample of 2 042 women engineers in the United States to test whether domain-specific self-efficacy and outcome expectations predicted job satisfaction and organisational commitment – two influential predictors of turnover cognitions and behaviours. Domain-specific must be extended to context-specific and, if one wants to drill further, culture-specific. The Western cultural ideologies of the United States are very different to those in a diverse, Third World emerging market such as South Africa. This is not to claim that findings will present as oppositional if done within the latter's context, rather than those findings may be similar and also show differences which will resonate and articulate differently in terms of career development contributions that are uniquely South African-based.

Miles and Naidoo (2017) included 222 Grade 11 learners from three South African schools. Their study confirms that a group-based career development programme, designed specifically for the South African context, can serve as an essential tool to help high school learners from different socio-economic backgrounds enhance their career maturity, expressed in terms of their career decision-making self-efficacy. Brown and Lent (2017) assessed the primary experiential sources of self-efficacy and outcome expectations relative to career exploration and decision-making

activities, using a sample of 324 college students. Their findings indicated that source variables accounted for a larger portion of variance in self-efficacy than did outcome expectations.

Good support was also found for a path model including source variables in the prediction of career exploration goals and levels of career decidedness. The key findings of a study by Milan-Tyner (2018), based on African American women undergraduates at a predominantly White university, suggest that African American women need career development that transcends conventional strategies, recognises the dynamics of race, gender, and class as a three-way intersection, and incorporates culturally relevant approaches.

Most, if not all, of these studies used the SCCT model to measure efficacy and outcome expectations of individuals who were yet to enter a work environment. Their findings reaffirm the relevance of the SCCT model to assist in answering the questions about career orientation raised in this study. Career theorists Fouad and Santana (2017) explicitly recommended further research in the area of career development, with a focus on women and their intersecting identities in relation to their career development.

This study aligns to the above recommendation by considering a specific minority group, South African Indian women in a predominantly male-dominated profession. This research will analyse and develop the social cognitive mechanisms triggered by the play of intersectional identities of race and gender, within a bicultural space. The investigation will focus on the contextual factors (support and barriers), and the influence of cognitive processes (*self-efficacy, outcome*

expectations) on the decision by the women under consideration to remain career-orientated engineers.

2.3 Conceptual Framework

Miles and Huberman (1994) defined a conceptual framework as a visual or written product, one that "explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables—and the presumed relationships among them" (Maxwell, 2004, p. 33). According to Merriam (2009) qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world (Merriam, 2002). By integrating the theoretical perspectives of Identity, Biculturalism and Social Cognitive Career Theory, central concepts will be employed to feed into an adapted version of the SCCT model to aid the trajectory of this study. This version of the model will be denominated the Bicultural Social Cognitive Career Model (BSCCM).

2.3.1 Concepts drawn from literature on identity.

Three perspectives for understanding identity in an organizational setting will be infused into the construction of the conceptual framework. These are social identity (the creation of identity – "Who am I?" – Personal Identity) – *personal context*; Identity construction (how it is shaped and reshaped – "Who am I in relation to others? How do they contribute to the changing me?"; and Relational Identity – *Personal and Professional context*) and Identity regulation (how identity can be controlled and affected by various organizational aspects – "How do they expect me to act/behave?" – *collective identity*) (Alvesson et al, 2008). Inter-identity fit presents a dimension

of understanding that this study will explore in terms of how gender and race, as static constructs of identity, react or relate to an individual's context. Crenshaw (1989) postulated that identities could not be understood as stand-alone but as interlinked versions of one's self that are formed and function within systems/structures of oppression. Hence, an intersectional approach to gender and race will feed into the framework.

2.3.2 Concepts drawn from literature on biculturalism.

The study of biculturalism by Bell (1990) emphasised the concepts of the two cultural contexts and bicultural stress. These contexts will be displayed in the conceptual framework as the personal, making reference to the home and professional, referring to the engineering space. Triandis (1989) outlines the three aspects of self (personal, private and collective) and three dimensions of cultural variation (individualism-collectivism, tightness-looseness, cultural complexity) in response to the self. The dimensions of cultural variation and its connection to aspects of the self are significant for understanding why people behave or navigate differently when in a specific cultural context. Cultural tightness-looseness and individualism-collectivism depend on which context the self finds itself in and determine the individual's response and experience.

2.3.3 Concepts drawn from literature on Social Cognitive Career Theory.

Concepts adopted from SCCT are those that seek to explain social cognitive process, namely self-efficacy, outcome expectations and domain-specific contextual factors (as support and barriers) (Lent et al., 1994; Lent et al., 2000; Lent, 2006). This exploration will seek to tease out possible nuances in relation to the process of socialisation and its influence on intersectional identities of

race and gender, and cognitive processing with links to career choice behaviour and orientation. The conceptual framework will illustrate each context (personal and professional) and the effect of intersecting identities of race and gender in the bicultural space together with how this translates into the bicultural life experiences of South African Indian women engineers.

2.4 Summary

Investigations conducted for this study were executed with the hope of developing valuable insight into the thought, action and meaning processes of participants through their early to present life, emphasising the fluidity and temporal nature of the identities they must balance in the bicultural space (Bell, 1990; Rooney et al., 2016). The effect of this action and meaning process on social cognitive processing refers to managing perceptions or beliefs about oneself in this space in relation to the decision to remain career-orientated (Kur and Bunning, 1996; Benet-Martínez et al., 2002; Benet-Martínez and Haritatos, 2005; Brannen and Thomas, 2010; Sanchez-Hucles and Davis, 2010; Huynh, Nguyen and Benet-Martinez, 2011).

The convergence point of biculturalism and Social Cognitive Career Theory is what makes this a good marriage. Both emphasise the socialisation process and how this feeds into a socially conditioned psyche, plus the effects of this on a minority woman's perception of her world and where she fits in, which inevitably informs her choice and actions in every facet of her life (Bell, 1990; Lent et al., 2000; Lent, 2006; Lent et al., 2008; Brown and Lent, 2017). The contextual factors in this research constitute the bicultural space, which entails two differing contexts, the personal and the professional. Each has its own unique breeding ground for the socialisation process a woman undergoes and from which her identities are born, shaped and reshaped (Meer,

1972; Radhakrishnan, 2005; Khan, 2012; Ahmed and Carrim, 2016; Jaga et al., 2018). These identities are nothing but the products of perceptions about her role as a woman: a woman of colour, a woman raised in a patriarchal society, a woman who will at some point enter the world of work in a profession known to be male-dominated.

At this point her cognitive processes are based not only on what others think about her (home, community, work) but her own beliefs about herself as a South African Indian woman engineer (Radhakrishnan, 2005; Carrim, 2012, 2016; Ahmed and Carrim, 2016; Khan, 2012). By merging concepts of biculturalism and Social Cognitive Career theory, the research will investigate how the interplay between her intersecting identities and the contextual factors within her bicultural space informs her social cognitive processing and articulates into her actions and decisions in relation to her career orientation (Bell, 1990; Lent et al., 2000; Lent, 2006; Lent et al., 2008; Brown and Lent, 2017).

This section expanded on the literature that has been reviewed in the areas of identity, biculturalism, Social Cognitive Career Theory including gendered organisations and women in the workplace, and touched on intersectionality. The literature reviewed provided a wealth of knowledge that gave rise to three main research questions:

Research Question 1

How does identity inform a bicultural context for South African Indian women engineers?

Research Question 2

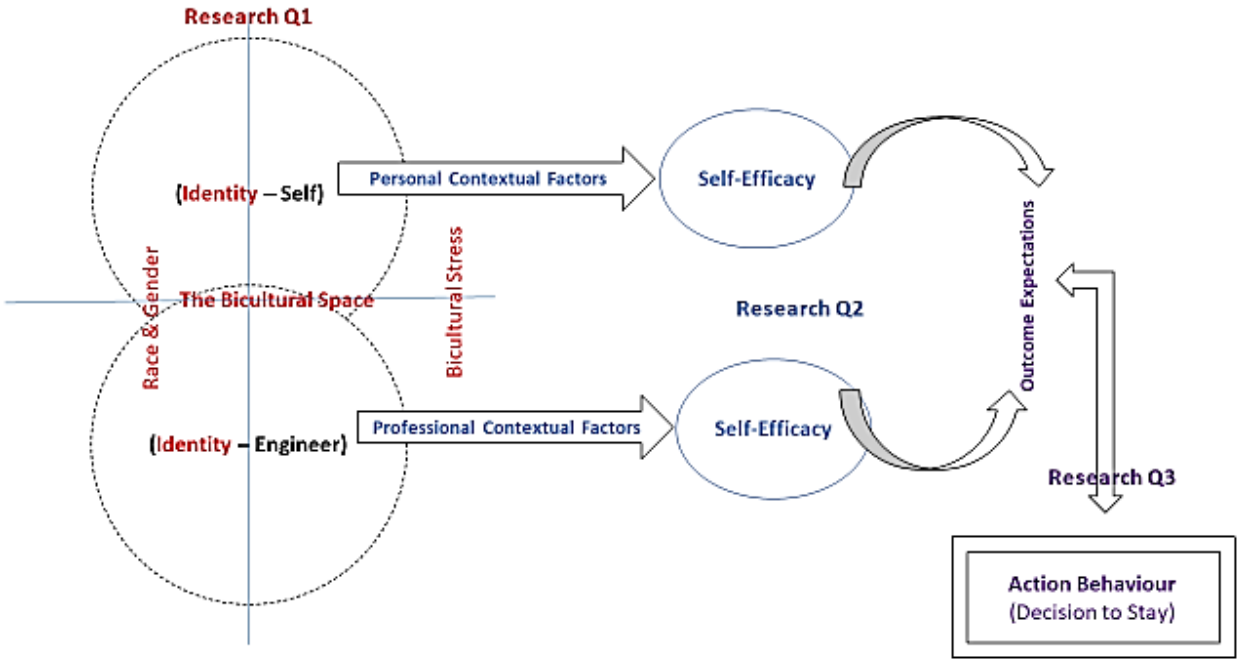
How does a bicultural context inform South African Indian women engineers' social cognitive processing (self-efficacy and outcome expectations)?

Research Question 3

How does social cognitive processing inform South African Indian women engineers' decision to remain in their profession?

The conceptual framework below is a pictorial representation of integrated concepts stemming from biculturalism and Social Cognitive Theory that will serve as a roadmap and guide the trajectory of this study.

Figure 2: Conceptual Framework



Source: Adaptation of SCCT Model to reflect a Bicultural Cognitive Career Model.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This research is positioned in a conceptual framework premised on an interpretivist approach. The respondents' narratives accord with the understanding of life experiences within a bicultural existence as a process of social construction and therefore adopts a constructionist frame. Research has shown that racio-ethnic and gender similarities between interviewer and interviewee can and do affect rapport during the interview, while power differences between the researcher and subject are always present (Bhopal, 2001). Hence, a co-inquiry approach will be used wherein aspects of the researcher's own life story will be shared to eliminate any room for power difference, given racial and gender similarities. This research is interested in not just the lived experiences of these women, but the meaning they attach to their experiences from their perspective as the storytellers. Given the nature and objectives of the current study, an interpretivist/constructivist paradigm was the appropriate choice.

Lincoln and Guba in Denzin and Lincoln (2000) describe constructivism as people actively constructing their realities through their own lived experiences and making sense of them from their perspectives. This approach was suitable for the current research, given the focus of this study on exploring the meanings attached to the experiences of a sample of women in relation to a specific context. Hence, the constructionist approach to investigation aligns well with the theoretical underpinnings of biculturalism and social identity theory. The use of this constructionist lens encourages a different engagement with the respondents, which assisted in unearthing the meaning making of their multiple identities, and experiences that were specific to

them as South African Indian women. Transcripts and their respective narratives underwent two processes of analysis that presented common categories grouped to form main themes. The focus was to interpret and give meaning to an experience as narrated by a participant in conveying her story within a bicultural context. This section discusses the chosen paradigm, adopted research design, related methods of data collection, sampling, validity, reliability and ethical considerations employed for this study. The chapter will conclude with a comprehensive account of how the data collected was analysed.

3.2 Research Design and Paradigms adopted for the Study

The content below will demonstrate the researcher has thought processes based on her review of relevant literature on methodology. This review guided the researcher's choice of paradigm and the associated, best-fit design that will inform the methodological course of this study. Selecting an appropriate paradigm was important as it shaped the lens through which the design employed would make methodological sense. The right combination of paradigm and design is an important pairing to ensure the extraction of rich data that will inform the golden thread of this study.

3.2.1 Research Design.

A research design is a plan adopted by a researcher to deal with a specific topic in terms of methodology employed, collection of data and analysis of collected data. A chosen design is one that is justified by the researcher to his audience through his/her review of various theoretical assumptions and debates around the area of research (McCaslin and Scott, 2003; Merriam, 2009; Carcary, 2009; Bryman, 2012). Research designs identified for scientific research are qualitative,

quantitative, or mixed, with each being informed by three broad concepts: a) the underpinning philosophical worldview, b) the strategies of inquiry, and (c) the research methods employed (Creswell, 2009).

This study adopted a qualitative methodological approach for enquiry. Qualitative research relates to meaning and process where these concepts might not be examinable by quantity or amount. Qualitative research aims to provide specific understanding of a phenomenon based on the understandings of those experiencing it (Alharahsheh and Pius, 2020, p. 40). Qualitative research is interpretive and focuses on real, located practice, and is based on an interactive research process involving both the researcher and the social actors (Creswell and Creswell, 2017). This approach considers the way in which the world is assumed, investigated, or fashioned by people's lives, behaviour and interactions. It is also considers processes, change, social context dynamics and participants' perceptions of their own world (Creswell and Creswell, 2017). Additionally, qualitative research considers meanings in personal narratives, in life stories, in forms of social interactions, in the different knowledge, perspectives and practices in what people think, and what that thinking means, infers and denotes (Miles and Huberman, 1994). The underpinnings of this approach render it a best fit for the study because the data to be collected requires interaction between researcher and participant, as the enquiry is rooted in the construction of realities and meaning making/interpretation of these realities/life experiences.

3.2.2 Research Paradigm.

Interpretivism is more concerned with in-depth variables and factors related to a context: it considers humans as different from physical phenomena in that they create further depth in

meanings with the assumption that human beings cannot be explored in a similar way to physical phenomena (Alharahsheh and Pius, 2020, p. 41). The interpretivist paradigm, which is associated with qualitative design, assumes that reality is socially constructed and that there are multiple realities, or interpretations, of a single event (Creswell and Creswell, 2017). The aim of this paradigm is to make sense of the diverse experiences of individuals interacting with each other and their contexts, and constructing meaning from these experiences (Merriam, 2002). Schwandt (1994) describes the goal of this persuasion as one that "has an abiding concern for the life world, for the emic point of view, for understanding meaning, for grasping the actor's definition of a situation, for *Verstehen"* (Schwandt, 1994, p. 221). The table below provides the research philosophy of this paradigm and indicates its application into the methodological approach of the current study.

Table 3: Research Philosophy – Interpretivism

Ontology (nature of reality or being)	Epistemology (what constitutes acceptable knowledge)	Axiology (role of values)	Typical methods
Complex, rich Socially constructed through culture and language Multiple meanings, interpretations, realities Flux of processes, experiences, practices	Theories and concepts too simplistic Focus on narratives, stories, perceptions and interpretations New understandings and worldviews as contribution	Value-bound research Researchers are part of what is researched, subjective Researcher interpretations key to contribution Researcher reflexive	Typically inductive. Small samples, in depth investigations, qualitative methods of analysis, but a range of data can be interpreted

Source: Saunders, Lewis and Thornhill (2012).

This study interpreted the participants' meanings attached to their bicultural lives, by approaching the concept of identity through a social constructionist lens while adopting a qualitative design.

Qualitative researchers are most interested in how humans arrange themselves and their settings and how inhabitants of these settings make sense of their surroundings through symbols, rituals, social structures, social roles and so forth (Lune and Berg, 2017, p. 15). Qualitative research is interested in how meaning is constructed, how people make sense of their lives and their worlds. The primary goal of a basic qualitative study is to uncover and interpret these meanings (Merriam, 2002).

Parry, Mumford, Bower and Watts (2014) list the reasons for doing qualitative research: (a) flexibility to follow unexpected ideas during research and explore processes effectively; (b) sensitivity to contextual factors; (c) ability to study symbolic dimensions and social meaning; (d) increased opportunities; (e) to develop empirically supported new ideas and theories; (f) for in-depth and longitudinal explorations of a phenomenon; and (g) for more relevance and interest for practitioners.

Ospina (2004) also lists various advantages of using qualitative methods for studies, two of which are directly linked to the objective of this research: (a) To try to "understand" any social phenomenon from the perspective of the actors involved, rather than explaining it (unsuccessfully) from the outside; and (b) To understand complex phenomena that are difficult or impossible to approach or to capture quantitatively. Exploring such social constructs through quantitative methodology would be possible, but not appropriate, given that deconstructing a social construct, its nature, and its players, requires probing and in-depth interpretation. Hence, the chosen design was an appropriate fit for the interpretivist constructionist paradigm adopted for this study. Given that interpretation of an experience and the meaning respondents attach to their experience was

pivotal to the study, a quantitative approach would have failed to capture the inner, intimate details that qualitative strategy with its associated tools achieved in this study. One such tool is presented via the use of life stories. This methodological tool of choice ensures precise extraction of lived experiences.

3.3 Life stories through Storytelling

Storytelling

When one hears "Once upon a time", whether at the start of a fairy tale or an anecdotal account, the mind and imagination are opened to endless possibilities (Rooney et al., 2016). Stories are sense-making devices told in the present with a view to the future (Bennett and Detzner, 1997). On a real-world level, stories serve as a framework to enable the understanding of experiences (Webster and Mertova, 2007). At a primary level, there is a need for stories to act as the conduit through which one's experiences are communicated to others in order to create meaningful connections. Woodside (2010) argues that "as information is indexed, stored and retrieved through stories, the process of telling a story is episodic, cathartic and pleasurable for both the teller and the listener" (p. 532). How we tell, stories and how we interpret them are therefore paramount in gaining a deeper understanding of behaviour. According to Rooney et al. (2016) storytelling as a methodology is part of the narrative genre, hence overlaps of concepts and approaches are not uncommon. Storytelling finds its way into this study because it is seen as a separate unit of analysis, presented through verbatim interview transcripts containing life stories retailed by each participant (the storyteller) telling their life story to the researcher. The semi-structured interview questions were deliberately formulated in alignment with the Beginning, Middle and End format

(BME), allowing the researcher to coax participants to tell their stories, from childhood (beginning) to adolescence (middle) and adulthood (end), thus producing a life story.

Life stories

An individual's life story is an important source of information from which one can learn about associated experiences. Life stories express the storyteller's identity, which is a product of the relationship between life experiences and the organised stories of these experiences (Rooney et al., 2016). Authors claim that life stories are a way of fashioning identity, in both the private and public senses of the word (Boas et al., 2005). Conveying life stories helps people to think about, and understand, their personal—or another individual's—thinking, actions and reactions (Ollerenshaw and Creswell, 2002). The art of conveying a story is premised on elaboration, so stories are not static, but rather culturally and societally constructed, flexible and temporal in nature (Rooney et al., 2016). As a form of qualitative research, it is described as a method of inquiry entailing the use of stories as data, and more specifically, first-person accounts of experience told in story form and having a beginning, middle and end (BME).

Two important aspects of this inquiry are *perspective* and *context*. Perspective refers to a point of view regarding what is significant and what the listener needs to know. Context refers to external triggers, such as a social environment, natural surroundings or the cultural ideology of the actor/teller, the manner in which the narrator constructs the narrative, and the characteristics of written text.

Participants' responses to the semi-structured interview schedule involved telling the researcher their life stories, providing a rich description of their world through lived experience. Life stories

are constructed in a specific context by individuals and other players to whom they relate, in their personal and professional spaces. Verbatim capture of an interview provided a documented account of the participant's life story. This was the researcher's plan when creating the interview schedule. The format of the schedule adopted the metaphoric three-dimensional model premised on interaction, continuity and situation, using the beginning, middle and end (BME) format.

The researcher was confident that such an adoption would guarantee the interview would reap the participant's life story, from beginning (childhood), through middle (adolescence), and end (as adult in a profession). Accounts in this research were therefore presented in the format of participants' transcribed interviews, being life stories conveyed from participant to researcher. The interview schedule as planned prompted participants' stories to follow the BME sequence with initial questions touching on childhood, moving into adolescence and finally adulthood. These transcripts were further analysed by the researcher to create a narrative for each participant.

3.4 Narratives of Life Stories

Simply put, a *story* is what someone says, while a *narrative* is an account of what someone has said that a researcher conveys (Rooney et al., 2016). Narratives are not records of facts, of how things actually are, but a meaning-making system to make sense out of the chaotic mass of perceptions and experiences of a life (Boas et al., 2005). Whether the account is in the form of autobiography, life history, interview, journal, letters, or other materials that we collect, the text is analysed to ascertain the meaning it has for its author (Merriam, 2009). Language is a good medium to understand experiences. The narratives from participants provide an understanding of

experiences through knowledge, meaning and reality that is socially constructed. Narrative language allows for access to the subjective experience of the actor and leads to a newer understanding of the conception of self and identity and to new ways of studying memory and thought processes, culture, socialisation and lived experience (Reis and Judd, 2000).

Using the life stories contained in the interview transcripts, the researcher employed the metaphorical three-dimensional space of inquiry (Clandinin and Connelly, 2006) to guide a narrative analysis to create a narrative of each participant's story. This aligns with the "re-storying" process, through which the researcher retells or presents the participant's life story as a narrative (see section 3.6.3.5 on re-storying). Jan Vasina (1985) stated that memory constantly acts unconsciously and perhaps very slowly on the dormant data it contains. But the activity of recall and the encoding into memory of what one hears are obviously the main moments when the dynamics of memory operate. He further stated that the 'lack of chronology' in some societies weighs on the reliability of oral traditions and can only be partially remedied by recourse to outside sources (Vasina, 1985). This is a limitation that would have presented in this study had the participants not shared a similar history. The stories told by each woman reflected a chronology of a collective history that spoke to the personal and professional woes these women experienced and continue to experience.

3.5 Sampling Strategy

Merriam (2009) describes a non-probability sampling strategy as being based on the assumption that the investigator wants to discover, understand and gain insight, and therefore must select a sample from which the most can be learned. When recruiting participants for a study, with or

without the advocacy of an intermediary, it is important to consider their motivations for participation (Blandford, 2013). Participants in this research formed an integral part of the study, given that their interviews were key to providing the rich data required to generate answers to the three research questions. To ensure that rich data would unquestionably be secured, the researcher purposively selected a sample to be used based on set eligibility criteria such as age, professional years of experience, professional registration status, etc. Possible limitations in adopting this sampling method would be that the researcher could apply some bias in the individuals selected. However, the sampling technique used for this study eliminated this whereby snowballing depends on the referrals of participants' for potential participants.

This study adopted a narrative inquiry, making trust between researcher and participant particularly important. This trust ensured disclosure of real feelings, emotions and the meanings attached to these feelings, and did not present as an uncomfortable space for the participant. The objective was to ensure that the researcher's attempt to tease out important information did not become an overly uncomfortable, intrusive process for a participant. Gaining participants' trust was vital, to acquire intimate details of experiences associated with identity, which proved through the interview sessions to be an extremely sensitive area of discussion.

Criteria for the purposive selection were:

1. That some level of trust was secured between researcher and participant to gain higher levels of transparency and openness during interviews.
2. Only candidates with significant years of experience and who act as exemplars, and provide rich information, were included.

3. Candidates who shared the same race and gender, satisfied a specific age bracket and functioned in the same profession were selected. This was strictly adhered to, to ensure the sample was homogenous, thus increasing the trustworthiness of the study.

Participants in the current study were selected according to the following criteria:

1. Any South Africa-born Indian women who is a qualified engineer;
2. Currently employed or practicing as an engineer;
3. Must have a minimum of five years of work experience as an engineer;
4. Must be 25 or over in age; and
5. Can be based in any province in South Africa.

The targeted number for this study was 30 South African Indian women engineers with 25 being the end number of participants interviewed.

Process followed for the recruitment of participants

As a starting point to securing South African Indian women engineers, the researcher first approached a senior individual who was actively involved with transformation and gender issues pertaining to women in engineering. This was done with the hope of being able to obtain a list of women engineers fitting the eligibility criteria, rather than having to request referrals from participants. In this way, participants would be "blind" to who else was being interviewed. The individual initially agreed to assist, but in the end, no further contact could be made.The researcher then opted to make contact with someone known to her as a South African woman engineer who fitted the eligibility criteria and this individual advised the researcher that she would be able to

provide details of women fitting the criteria . The researcher decided snowballing would be the best way to secure participants.

Snowball Technique

A formal invitation letter was sent to this engineer and following receipt of informed consent, a first interview session was secured and executed. At the end of the session, the researcher explained to the participant the snowball technique being used and was offered the names of two potential participants. The researcher was advised the participant would first contact the two referrals to ensure they were comfortable, and if this were the case, details would be released to the researcher accordingly.

Similar requests were made to the next two participants. Snowballing presented a useful, practical and fluid tool, assisting the researcher to make quick contact and maintain momentum in the interview process. All participants were highly educated, with English as their first language, registered as professional engineers and fully involved in the profession. Some were CEOs of their own consultancies, with one being the first woman of colour to open an engineering consultancy. Others had presented papers at international conferences and worked abroad for their organisations on global projects. The interview sessions were highly stimulating and content-rich.

Even though saturation of data was reached quite early in the interview process, the researcher continued to interview to guarantee that saturation had indeed been reached and to also secure a number close enough to the initial target of 30. As explained above, the researcher informed each

participant at the conclusion of every interview session that the research was adopting a snowball sampling technique and invited contact suggestions for women eligible to participate.

This was well received and invitations were sent to these referred individuals, with most agreeing to participate in the study, securing a sample size of 25 South African Indian women engineers. There was a twenty-sixth participant; however, her interview session was purged owing to her no longer being in the engineering space. She was currently overseeing her husband's security company and had exited the field for some time. This was only detected halfway through the interview. The researcher continued with the interview but advised the participant thereafter that she did not satisfy the eligibility criteria. The researcher meanwhile also perused engineering websites such as WomEng and WIMSA (Women in Engineering South Africa) in an effort to spot potential participants. One participant was found using LinkedIn. The researcher contacted her as she fitted the criteria. This individual was also instrumental in providing names of women who were eligible and would be keen to participate. This process of snowballing worked so well that the researcher had at one stage a surplus of names submitted. Using the criteria as set out for this study's purposive sample, the researcher considered years of experience as a guide for selecting those most suitable to provide information.

The sample was not restricted by religion or vernacular and included women from Hindu (East), Muslim (East) and Christian (West) religious backgrounds. Given the first two religions significantly shape cultural ideologies that are patriarchal in nature and govern the family dynamics in their homes, opening the sampling frame to include women from the Christian religion was seen as adding significant nuances in terms of understanding the dynamics of Eastern versus

Western ideology in the personal and professional space and, in this way, exploring shared and differing themes arising from their interview sessions. Economic standing in this case determined class; hence, the participants' shared profession created homogeneity for the sample, in terms of their profession and the financial standing it afforded them.

Table 3 below presents details of the participants involved in this research.

Table 3: Participant Details

Pseudonym	Province	Designation	Domain	Age	Marital Status and Dependents (children)	Years of Work Experience
PrEng01	Gauteng	Electrical Engineer	Consulting Firm	34	Married No children	10 years
PrEng02	Gauteng	Engineer	Consulting Firm	32	Unmarried No children	11 years
PrEng03	Gauteng	Engineer	Consulting Firm	33	Married 1 child	9 years
PrEng04	Gauteng	CEO (Engineer)	Consulting Firm	38	Married 4 children	13 years
PrEng05	Gauteng	Engineer	Consulting Firm	31	Married No children	9 years
PrEng06	Western Cape	Civil Engineer	Consulting Firm	36	Unmarried No children	15 years
PrEng07	Gauteng	CEO (Engineer)	Consulting Firm	52	Married 3 children	29 years
PrEng08	Gauteng	Engineer (Fibre Optics)	State-Owned Enterprise	42	Married 2 children	17 years
PrEng09	Gauteng	Chief Engineer	State-Owned Enterprise	41	Married 2 children	18 years
PrEng10	Gauteng	Integration Engineer	State-Owned Enterprise	35	Married 2 children	15 years
PrEng11	Gauteng	Civil Engineer	CoJ (self-contained company)	35	Unmarried No children	12 years
PrEng12	KwaZulu-Natal	Welding Engineer	State-Owned Enterprise	34	Separated 1 child	7 years
PrEng13	KwaZulu-Natal	Engineer	State-Owned Enterprise	42	Divorced No children	19 years
PrEng14	KwaZulu-Natal	Civil Engineer	Consulting Firm	26	Married No children	6 ½ years
PrEng15	KwaZulu-Natal	Lead Engineer	Private Company	34	Married 1 child	12 years
PrEng16	Gauteng	Engineer (6 years) Lecturer in Engineering (5 years)	Private Company Higher Education Institution	32	Married 2 children	11 years
PrEng17	KwaZulu-Natal	Structural Engineering	Consulting Firm	31	Married 1 child	+10 years
PrEng18	KwaZulu-Natal	Engineer	Consulting Firm	36	Married 1 child	14 years
PrEng19	Gauteng	Civil Engineer	Consulting Firm	35	Married 1 child	+12 years
PrEng20	Western Cape	Engineer	State-Owned Enterprise	37	Married 1 child	14 years

PrEng21	KwaZulu-Natal	Engineer (water and sanitation)	Consulting Firm	39	Unmarried No children	15 years
PrEng22	KwaZulu-Natal	Civil Engineer	Municipality	31	Unmarried No children	9 years
PrEng23	KwaZulu-Natal	Civil Engineer (Structural Engineering)	Consulting Company	31	Married No children	10 years
PrEng24	KwaZulu-Natal	Engineer (Water Engineering)	Municipality	38	Married 2 children	13 years
PrEng25	Gauteng	Electrical Engineer	Municipality	36	Married 1 child	13 years

The selection phase involved no restrictions on marital status or sexual orientation, given that these categories also fed into the constructs of identities that speak to a bicultural existence and the social cognitive processing thereof. This allowed for an exploration of the differences present within a homogenous group (intra-group differences) that feed into the meanings of their unique experiences. Eighteen of the 25 participants were married, five were unmarried, one was separated and one divorced. Fifteen of the 25 are mothers. Fifteen were employed in the private sector or their income streamed from this sector. Ten serviced portfolios in the public sector. Thirteen participants resided in Gauteng, 10 in KwaZulu-Natal and two in the Western Cape. All participants satisfied the eligibility criteria stipulated for this study.

3.6 Data collection instrument and data collection procedure

A semi-structured interview schedule was used as the instrument of choice to collect data. The researcher initially pondered on the possibility of an unstructured interview, however, the chances that the intended (BME) structure of the interview could possibly compromised was highly likely if the stories told deviated from the main focus of the study. A semi-structured format was best suited as it would guide the storytelling process to be chronologically told as well as hold the conversation around the research objectives of the study. The interview schedule was created using

simple questions that would evoke a sense of comfort with the participant so that the session would adopt a conversational style. The interview schedule was presented to the panel to which the proposal for this study was defended and following their recommendations, adjustments were made and the final interview schedule was lodged with the University of Witwatersrand Ethics Committee for final approval. Once approval was secured, emailed invitations were sent to participants.

Following the emailed invitations sent to participants and their acceptance (indicated by the return of the signed informed consent), the researcher confirmed dates and times agreeable to participants to execute the interview sessions. Once an interview was concluded, the researcher embarked on the six-step process of collating and analysing data, as described by Braun and Clarke (2006). Below is an explanation of the six steps followed, indicating how each was implemented for the current study?

3.6.1 six-step process.

1. Interviews will be transcribed after every session to increase familiarity with the data, followed by reading the data, re-reading it and noting down preliminary ideas.
2. Next, initial codes will be generated systematically across the entire data set by collating data relevant to each code.
3. Organising codes into potential themes and gathering all data relevant to each theme.
4. Reviewing the themes: this involves refinement of themes. All collated extracts for each theme will be read to establish if they form a coherent pattern.

5. Each theme will be refined to reflect the overall story depicted by the analysis.
6. The final step involves producing the report (Braun and Clarke, 2006).

3.6.2 Six-Step Fieldwork Phase.

The six-step fieldwork phase is presented below, with each phase describing the sequential process followed during the fieldwork.

Phase 1: An invitation to participate in the study as well as an informed consent document was sent to each participant.

Phase 2: Interview sessions were held with each participant using a semi-structured interview schedule.

Phase 3: Data Analysis (Phase 1) – Three-dimensional analysis of life stories to create a mass narrative per participant. This was a manual process that the researcher adopted to re-story the life story into a narrative.

Phase 4: Collaboration – Narratives were shared with respondents to check validity of the re-storying process.

Phase 5: Data Analysis (Phase 2) – Transcripts were saved onto ATLAS.ti to assist the researcher with the thematic analysis of data collected that resulted in the extraction of main codes and themes.

Below is a detailed account of how the six steps were implemented.

3.6.3 Implementation of six steps for empirical work.

3.6.3.1 Phase 1 – Invitation letter with informed consent.

A letter was sent to each participant providing background to the study and including an informed consent form for completion. On receipt of the completed consent form, the researcher negotiated a date, time and venue suitable for the participant.

3.6.3.2 Phase 2 – Semi-structured Schedule – Interview Sessions.

This study explored sensitive pockets of information through direct engagement in an attempt to probe and tease out important information willingly from participants. Interviewing is necessary when we cannot observe behaviour, feelings, or how people interpret the world around them. It is also necessary to interview when we are interested in past events that are impossible to replicate (Merriam, 2009).

The researcher employed one-on-one interview sessions to engage with participants. Interviews may be more- or less-structured. The more structured it is, the more like a questionnaire it becomes, the less structured it is, the more it becomes like a conversation with a particular interest and focus. Hence, for this study a semi-structured interview schedule was formulated in response to the main concepts lifted from the study's conceptual framework. This allowed for the best of both worlds in one scheduled interview with many questions deriving from, but linked to, broader themes, thus allowing the interviewer to pursue lines of enquiry if something interesting and unexpected was presented by participants (Blandford, 2013).

Overall, *good* interview questions are those that are open-ended and yield descriptive data, even stories about the phenomenon, with the more detailed and descriptive the data, the better (Merriam, 2009). Only one set of descriptive data was utilised for this study and the instrument used to gather information was a semi-structured interview schedule. The interview schedule contained the study's three main research questions. However, owing to the broad nature of each question, these were fragmented into further questions that informed the main research question. If the main questions were presented in their original format, the potential to lead the interview session astray was highly possible. To ensure the story being told followed a sequential format, that is, beginning, middle and end (BME), it was imperative that the scheduled questions were broken down into questions that informed the main research question. This was done deliberately to also align with the approach that was adopted for coding and further analysis.

3.6.3.3 Phase 2 – Scheduling of Interview Sessions.

Some participants were located out of Johannesburg and in other provinces, so not all interviews could be carried out face-to-face. The Skype and WhatsApp platforms were used in such instances. Some interviews had to be moved when participants were unable to attend a booked session or if connectivity issues hindered the interview process. The researcher also experienced personal challenges and had to reschedule some interviews, with partipants' agreement. However, the researcher endeavoured to execute interviews in accordance with what had been discussed and agreed with particpants. In keeping with the ethical considerations of the study, prior to commencement of the interview session, the researcher:

- Confirmed the participant was comfortable with the session being recorded;

- Confirmed the participant was in the session of her own free will and not under duress;
- Advised the participant that she had the choice to not answer a question/s if she did not feel comfortable doing so;
- Advised the participant that she could at any point stop the interview and choose to no longer participate and that the recording would be immediately purged and not be included in the study;
- Advised the participant that no identifying data pertaining to her or any organisations at which she had been, or was still, employed would be divulged in the research. Information shared during the interview would be confidential.
- Advised the participant that a pseudonym would be given to her to assist her to identify herself within the research.

Interview sessions were scheduled to last an hour but ranged from the shortest being about 25 minutes to the longest being just over an hour. Most interviews were completed out of normal business hours. The researcher used her private mobile device to record interviews. This device was password-protected to restrict access.

3.6.3.4 Phase 3 Life Stories – Beginning, Middle and End (BME) Inquiry.

To ensure trustworthiness, audio recordings were transcribed using the services of an external transcriber. This was a decision taken by the researcher, given the shared history of researcher and participants in terms of race and gender. Use of an external transcriber ensured the captured data was extracted verbatim and not based on the researcher's interpretation of spoken words or

phrases. This was deliberate, as the researcher wanted to ensure the stories presented were untainted and free of any bias by the researcher that could have arisen during the transcription process. The researcher reviewed the actual audio recordings against the transcribed documents to confirm accuracy of the transcripts and to satisfy her mind that saturation had indeed been reached. The first phase in the analysis of the recordings was a preliminary exploratory analysis, inductively scanning and combing the data (Creswell, 2005, p. 237) to gain a sense of the data.

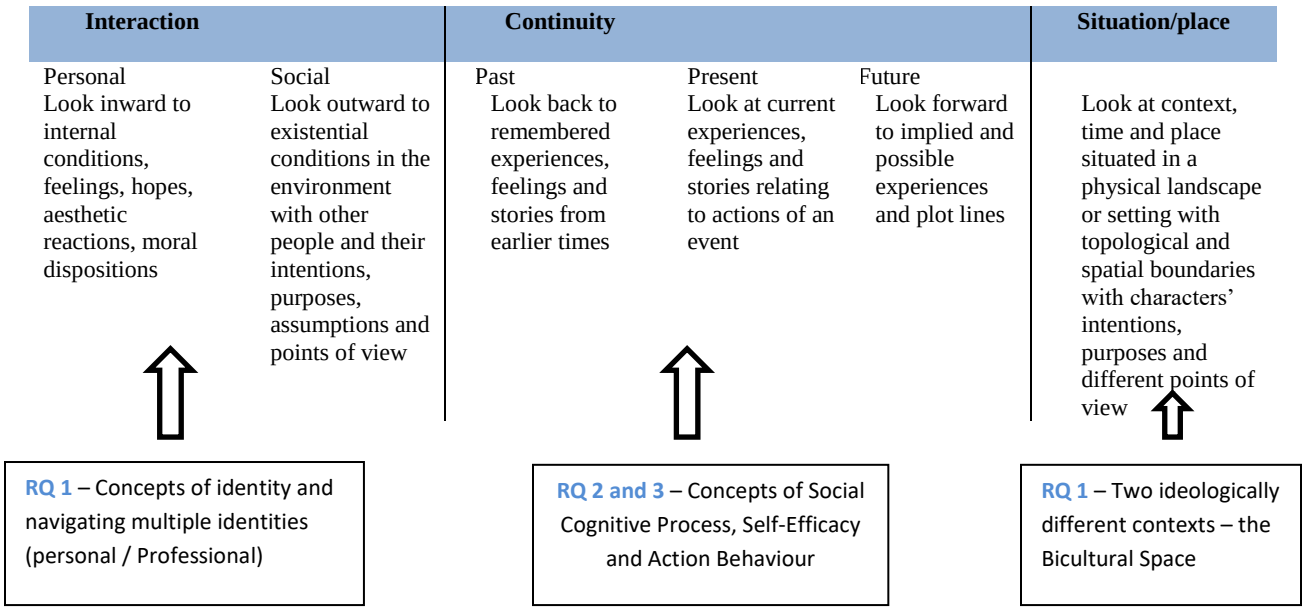
Questions contained in the interview schedule were prepared with the purpose of adopting the Beginning, Middle and End (BME) timeline and were therefore sequentially placed on the schedule. This was to ensure that the responses drawn fed into a chronological build of childhood (beginning), adolescent (middle) into adulthood (end) experiences. The recorded interview thus became the life story as told by the participant and was transcribed verbatim and to *give life* to the participant's experiences as her interpretation of her experiences of self, and self in relation to others, within her bicultural context. Transcripts (life stories) were printed and coupled with the relevant interview schedule per participant. The latter contained field notes that the researcher had been collating during each interview session. This process was relied upon as a pre-coding exercise with the conceptual framework forming a basis for the information noted.

3.6.3.5 Phase 3 Narratives – Three-Dimensional Inquiry (Analysis – 1).

Twenty-five transcripts (life stories) were explored using the metaphorical three-dimensional space of inquiry (Clandinin and Connelly, 2006) to create a narrative for each respondent. This space of inquiry is based on Dewey's philosophy of experience, which is conceptualised as both personal and social (Clandinin and Connelly, 2006). The three dimensions of the metaphorical

narrative inquiry space are: (a) the personal and social (interaction) along one dimension; (b) past, present and future (continuity) along a second dimension; and (c) place (situation) along a third dimension (Clandinin and Connelly, 2006). Participants' (a) personal and professional spaces in this study refer to their bicultural space, and (b) their life story—as expressed in their interview and comprising their unique experiences of their past, present and envisaged future and their situation—was explored looking at the situation of being in a bicultural context.

Table 4: Adapted Version Structure of three-dimensional space narrative analysis approach



Creswell (2002, p. 340).

This approach is used in this study as per the three dimensions depicted above in Table 4 as follows:

a) **Interaction**: Transcripts were analysed to extract self/personal experiences and relational experiences in the participants' social and professional spaces.

b) **Continuity**: Transcripts were analysed to lift information pertaining to the past and present experiences. From these two categories, implied future considerations were also extracted.

c) **Situation**: Specific places and/or situations are investigated as described in the transcript in terms of participants' lives in their bicultural context.

This type of narrative analysis is complex and involves a process of "re-storying" an account from the original raw data (field text). This re-storying process includes reading the transcript (field texts), analysing the story to understand the lived experiences, and then retelling the story through the creation of a narrative. During the re-storying process, the researcher will engage in collaboration, renegotiate information with the participant, and go back to the field text: finally, the researcher will find a narrative text that gives an account of the participant has lived experiences (Ollerenshaw and Creswell, 2002).

The 25 narratives created were shared via email with all participants to review and confirm the authenticity of this re-storying process. This approach emphasises the relational dimension of narrative inquiry. That is, narrative inquirers cannot isolate themselves from the inquiry process. They have to find ways to inquire into their participants' experiences, meaning their experiences as well as the co-constructed experiences developed through the relational inquiry process (Clandinin, 2006). Simply put, this means the inquirers are a part of the very same world in which their participants live (Clandinin, 2006). This method of extracting stories is significantly based on the fluid and temporal nature of identity, showing through each story (social construction of the

meaning of an individual's reality) the play and intersection of the various identities though time and within contexts.

3.6.3.6 Phase 4 – Collaboration (test for validity and authenticity of narratives).

Narratives created from transcribed interviews were sent to each participant once the analysis of their interviews had been concluded to enable review of their transcriptions and check for correctness of interpretation, while eliminating any possibility of misinterpretation or bias by the researcher. Given that the researcher shares similar race and gender with the respondents, this step is crucial in eliminating any researcher bias relating to how interviews were transcribed.

3.6.3.7 Phase 5 – Thematic Analysis of Narratives to Extract Codes and Themes (Analysis – 2).

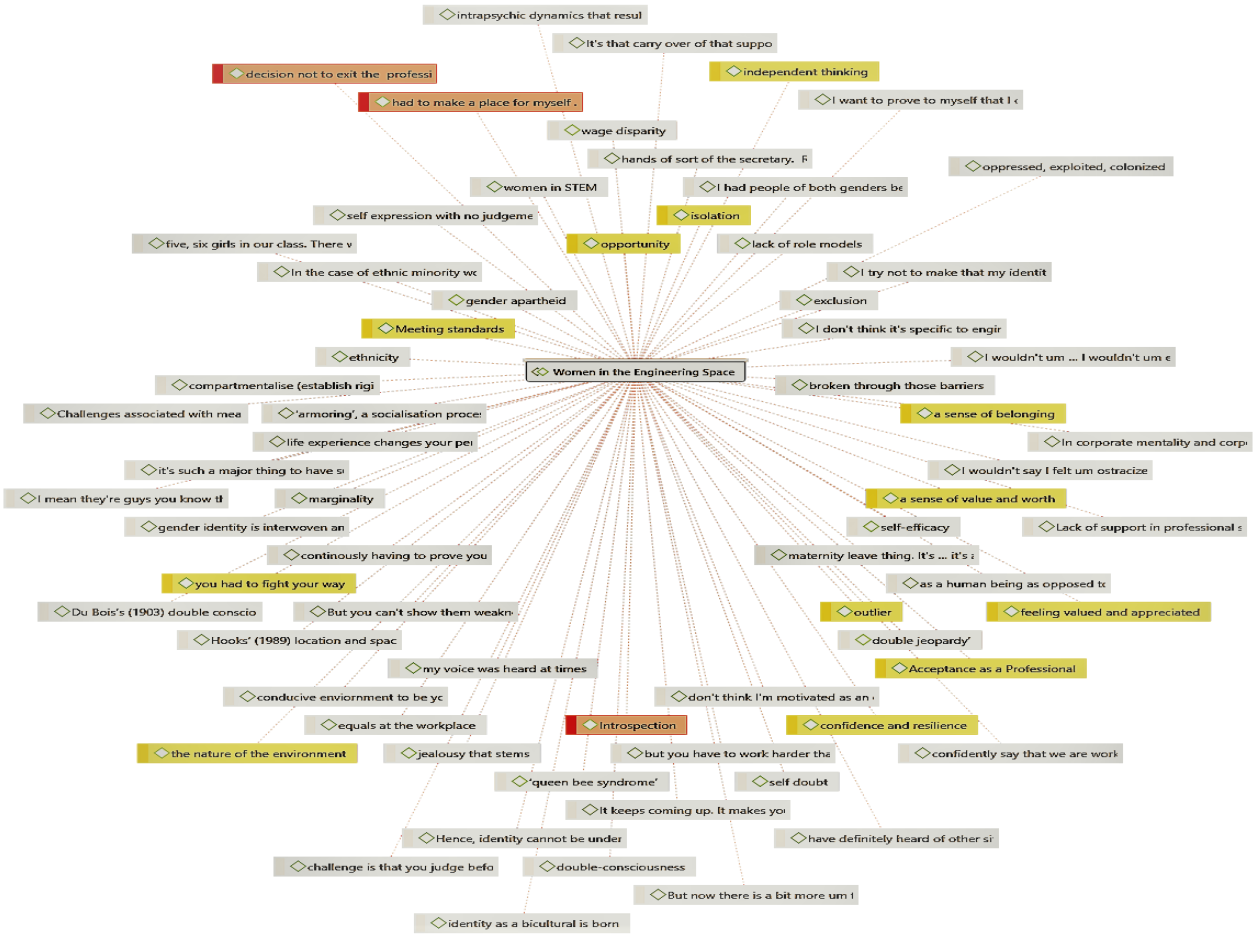
This analysis identified major codes that informed the themes (e.g. *similarities and differences/ categories*) (Bryman, 2012). Emphasis is on the content of a text – "what" is said more than "how" it is said, the "told" rather than the "telling" (Merriam, 2009). These main themes were then applied to the main research questions stemming from the research problem of this study to make a case for findings. All narratives, as well as initial transcripts, were reviewed to identify codes that were collapsed into main themes and sub-themes. Transcripts were captured onto ATLAS.ti data analysis software, and the researcher arrived at 513 codes, consisting of single codes and NVivo codes (quotes or phrases), which were placed into 10 code groups displayed below.

Table 5: Extract of Code Groups from ATLAS.ti

Code Groups
Bicultural Dilemma (66)
Indian Cultural Norms and Values and Family Support Structure (51)
Men in the Engineering Space (47)
Motivators for SA Indian Women Egineers to remain career orientated (30)
Navigation Tools (77)
Professional Support Structures (48)
Racism, Sexism and Ageism (72)
Societal Perceptions of a Woman's Role (47)
Support from men (personal or professional capacity) (11)
Women in the Engineering Space (69)

The code groups were then collapsed into seven networks, which showed codes linked as well as the frequency of these codes in terms how prominent or less prominent they were appearing in the transcribed interviews and the narratives created from the interviews. An example is given in Figure 3 below of one of the seven networks used as a grounding for the concepts that informed the conceptual framework of this study to generate main themes.

Figure 3: Extraction of a network from ATLAS.ti



Creation of major themes was guided by the main concepts informing the conceptual framework that borrowed from Identity, Theory of Biculturalism and Social Cognitive Career theory.

3.7 Reliability and Validity

Qualitative research methods have received much criticism from the positivistic approach to research methodology and this is caused by concerns relating to validity, reliability and generalisation (Merriam, 2009; Bryman, 2012). These three terms have been used by quantitative

researchers and, it has been argued, are inappropriate for those in the qualitative domain, given that an underlying assumption of qualitative research is the notion of multiple realities and no single truth, whereas the scientific positivist approach is one that sees reality as static and objective.

According to Merriam (2009), qualitative research should consider validity and reliability from a perspective congruent with the philosophical assumptions underlying the paradigm. This way credibility, transferability, dependability and confirmability—as substitutes for internal validity, external validity, reliability and objectivity—have become widely adopted in qualitative research (Merriam, 2009). Lincoln and Guba (1985) proposed using two different approaches to qualitative study to deal with the reliability and validity issues and refer to **trustworthiness** and **authenticity**. Trustworthiness involves establishing (a) *Credibility* – confidence in the "truth" of the findings; (b) *Transferability* – that the findings have applicability in other contexts; (c) *Dependability* – that the findings are consistent and could be repeated, and (d) *Confirmability* – neutrality, that the study is shaped by participants and not the researcher (Lincoln & Guba, 1985). They provide an array of techniques that can fulfil the above criteria, some of which were employed in the current study.

3.7.1 Triangulation (a) Credibility and (b) Confirmability.

From an **interpretive-constructivist perspective,** triangulation remains a principal strategy to ensure validity and reliability (Merriam, 2009). This process entails using more than one method or source of data in the study of social phenomena (Merriam, 2009; Bryman, 2012).

This study used two sources of data, namely:

1) Literature (global and national) pertaining to the areas under research; and

2) Semi-structured interviews.

The study used two methods of analysis, namely:

3) Three-Dimensional Analysis; and

4) Thematic Analysis.

3.7.2. Participant validation/Member Checks (Credibility).

The re-storying process, described by Clandinin and Connelly (2000) as retelling, first involves collaboration and renegotiating information with participants plus returning again and again to the field text. Finally, the researcher writes interim texts to find a narrative text that promotes an account of participants' lived experiences (Ollerenshaw and Creswell, 2002). The researcher sent a narrative to each participant to validate that the story, as re-told by the researcher, was a true representation. This window of engagement allowed the researcher to re-track where participants indicated areas of ambiguity or misrepresentation. In terms of credibility and reliability, this process of collaboration between researcher and participant removes any shadow of doubt that may present itself to insinuate that the researcher is misrepresenting participants' accounts of their lived experiences, as influenced by the researcher's personal bias.

3.7.3 Adequate engagement in data collection and data saturation (Credibility).

This strategy is one that has the researcher attempting to capture, as accurately as possible, participants' understanding of a phenomenon. Determining the number of people to interview can sometimes pose a challenge for a researcher, given that every study is different and has its own particularities. Merriam (2009) states that the best rule of thumb is that the data and emerging

findings must feel saturated; that is, you begin to see or hear the same things over and over again, and no new information surfaces as you collect more data. This is an indication that no further interviewing is required. She also alludes to spending time collecting data to find alternative ways that the data could be presented: the lack thereof increases levels of confidence in the original idea the researcher presents. Saturation for this study was reached quite early in the interview process, however, the researcher continued to interview to reach a number close enough to the required sample size of 30 as per the recommendation of the panel that reviewed the proposal for this study.

3.7.4 Self-Reflexivity (Confirmability).

This study uses narrative inquiry, with the main process of this type of inquiry being that stories are co-constructed by the researcher and the participants in the research (Clandinin, 2006). This is referred to as reflexivity. This strategy seeks to emphasise that the researcher is part of the research process and can be influential in the trajectory of the study (how it develops over time) and the engagement of participants. Hence, the researcher's values and bias have to be explicitly reported and in so doing, the researcher enables the findings of the study to reflect the participants' voices and not the researcher's (Merriam, 2009; Bryman, 2012). The researcher, in keeping with this, will provide an account of her life story in Chapter 6 as a South African born woman of Indian descent sharing the same history as the participants. Sharing her story will eliminate for readers any potential bias from the researcher. Sharing her story will show researcher and participants similarities in terms of race, gender and ethnicity but will more importantly highlight differences in terms of their contextual experiences allowing the researcher's objective voice to be heard.

3.7.5 Thick description – (Transferability).

Lincoln and Guba (1985) posit that **t**hick description acts as a means of achieving a type of external validity. Provision of a detailed, rich description of a phenomenon means other scholars can then evaluate the extent to which conclusions reached through the findings of the study could be transferable to other contexts and people (Lincoln and Guba, 1985). The narrative approach of this study provides a rich description with arguments that are persuasive and guide the readers through a journey of evidence as per extracts from participants' stories: these come with explanations of why other interpretations—as attempted during the research process—are not as adequate as the view presented in the final thesis (Bryman, 2012).

3.8 Ethical Considerations

Step One

Ethical clearance was requested from, and granted by, the Wits University Ethics Committee to allow the researcher to engage in fieldwork. This committee would peruse the informed consent letter, the interview schedule and review the researcher's proposed steps to ensure that this study was carried it in an ethicl manner.

Step Two

Participants were issued a letter of invitation to participate in the study containing explicit information on how confidentiality would be preserved (refer to Annexure A). An informed consent declaration form (Annexure B) was also issued, which participants were required to sign. Participants were advised in the informed consent letter, as well as verbally during the interview

session, that they retained the right to not answer a question or questions if they so wished and that they had the choice to withdraw at any time during the interview session or from the study. Assurance was given that should they decide to no longer participate, their session (recording) would be purged. Participants were advised that the recordings on the recording device was password protected and only the researcher could access these recordings.

To ensure confidentiality and protection of personal information, all participants were allocated a pseudonym of which they were made aware when their respective narratives were shared with them. The researcher also advised respondents that no identifying data, in terms of individual or organization, would be divulged in the writing-up of this thesis.

Step Three

The researcher would refer participants to a counsellor/psychologist should they express strong emotional responses that could lead to them breaking down or becoming highly stressed during or after the interview. Interviews that took place involved emotionally strong women who were highly transparent about their experiences and were not afraid or shy to be articulate. None showed any signs of uneasiness or anxiety for the services of a counsellor/psychologist to be requested.

CHAPTER 4: PRESENTATION OF FINDINGS

4.1 Introduction

Data analysed in this study stems from the responses of 25 South African Indian women engineers collected using a semi-structured interview schedule. The aim of collecting the data was to explore experiences specific to this sub-set of women in terms of their racial grouping, their voice and agency, as expressed by themselves through their stories in respect of the differing contexts within which they exist. Analysis of this data sought to comprehend the main drivers or disablers within their contexts that influenced their cognitive processing (thoughts) to provide a deeper understanding of their decision (action behaviour) to remain in engineering.

The interview schedule used for all respondents served as an instrument through which answers could be obtained for the main research questions of this study, namely:

- How does **identity** inform a bicultural context for South African Indian women engineers?
- How does a **bicultural context** inform South African Indian women engineers' social cognitive processing (self-efficacy and outcome expectations)?
- How does **social cognitive processing** inform South African Indian women engineers' decision to remain in their profession?

This study drew on the Theory of Biculturalism and Social Cognitive Career Theory (SCCT). The former is premised on the understanding that a bicultural straddles two differing cultural contexts

and understanding how these differing cultural identities relate requires deep inspection of the meanings attached to experiences in these contexts which give rise to, or inhibit, voice and agency (Bell, 1990; Benet-Martinez and Haritatos, 2005; West et al., 2017). Social Cognitive Career Theory is anchored in Bandura's Self Efficacy Theory, which postulates a mutually influencing relationship between people and environment (Bandura, 1997). SCCT postulates that self-efficacy expectations are shaped by the following primary information sources, namely: (a) Performance Accomplishments; (b) Vicarious Learning; (c) Social Persuasion; (d) Physiological and affective states; and (e) Contextual barriers (Lent, Brown and Hackett, 1994).

The purpose of this research was to establish what influenced South African Indian woman engineers' decisions to remain in a White male-dominated profession and where current statistics and literature point to a shrinking pool of women in engineering. An intersectional lens was applied that allowed for deep inspection of a respondent's identities in both contexts, which according to SCCT relate to her levels of self-efficacy, social cognitive processing and action behaviour. In this chapter, the following will be presented: (a) main categories and themes that emerged from the data, and (b) presentation of the findings of this study.

4.2 Codes and Themes

Codes and Themes below are presented per the application of the two approaches for the analysis of data used in this study, namely Metaphoric Three-Dimension Analysis and Thematic analysis.

Table 6: Extracted Codes and Main Themes

Research Question	Key Literature Reviewed	Codes	Themes Identified from Findings
How does **identity** inform a bicultural context for South African Indian women engineers?	**Tajfel and Tuner (1979)** Social identity and social categorisation **Hooks (1989)** – "Otherness" **Du Bois (1969) – "Double consciousness**" – Living in two spaces each housing its own systems of oppression **Bell (1990)** Bicultural life structure leads one to a position of marginality. One lives on the boundaries of two distinct cultures **Acker (1990, 1992, 2000, 2006)** Gendered organisations **Crenshaw (1991)** Intersectionality Double, triple, multiple, many-layered blanket of oppression **De la Rey (1997)** Construct of 'triple oppression' **Booysen and Nkomo (2001, 2010)** Core identity governed by two areas of race and gender, and that this identity is shaped and reshaped by a person's social interactions and social institutions **Littrell and Nkomo (2005)** Stereotypes of gender roles created by a culture govern our way of life throughout our existence **Ryan and Haslam (2005)** Women and leadership **Alvesson et al. (2008)** Social and organisational identity Cultural and historical formation of identity **Harnois (2015a) Haronis (2015b)** Minorities and multiple, interconnected systems of inequality experienced **Turner-Zwinkels et al. (2015)** Inter-identity overlap of multiple identities within self in relation to the social world **Carrim (2012), Carrim and Nkomo (2016)** Identity work – South African Indian women **Ahmed and Carrim (2016)** South African Indian women – spousal support **Jaga et al. (2018)**	• History of South African Indian people • Entrenched cultural norms and values • Patriarchy • Socialisation process • Perceived role of an Indian woman • Community/societal expectations of an Indian woman • Misconceptions about the profession • Strong family support structure • Perceptions of women (weaker sex) • Perceptions of women in engineering • Feelings of isolation and loneliness • Sexual harassment • Undermined and overlooked • Silenced voice • Mentorship • Sisterhood/role models • Work harder to prove yourself • Fronting • Construction/site experiences	**Theme 1: Negotiating a Bicultural Identity** • Perceptions of self – childhood – adolescent to adult experiences • The changing dynamics of an Indian family (cultural looseness and tightness – application of norms and values) • Bicultural stress/dilemma **Theme 2: Societal Perceptions about Women and Women in Engineering** **Theme 3: Male-dominated space** • White male/male-dominated industry • Gender stereotyping – Articulating but not being heard • Isolation and alienation – 'the old boys' club' • Expectations of female engineers by benchmarking throughout of work by male engineers • Mentorship and sisterhood

Research Question	Key Literature Reviewed	Codes	Themes Identified from Findings
	Work-family conflict **West et al. (2017)** Biculturalism **Schwartz and Unger (2010)** **Benet-Martínez et al. (2002)** **Benet-Martínez and Haritatos (2005)** **Benet- Martinez (2006)** **Sanchez-Hucles and Davis, (2010)** Biculturalism and ethnic minority women		
How does a **bicultural context** inform South African Indian women engineers' social cognitive processing (self-efficacy and outcome expectations)?	**Meer (1972)** Traditional roles of Indian women **Bell (1990)** Bicultural life structure **Schein et al. (1996)** Think manager, think male bias **Lent (1994,1996,2000,2006,2008,2013)** Social Cognitive Career Theory **Batliwala and Dhanraj (2004)** Traditional patriarchal ideologies in the Indian home **Govinden (2008)** Indian women and agency **Turner-Zwinkels et al. (2015)** Inter-identity overlap of multiple identities within self in relation to the social world **Harnois (2015a) Haronis (2015b)** Minorities and multiple, interconnected systems of inequality experienced **Carrim (2012), Carrim and Nkomo (2016)** Identity work – South African Indian women **Ahmed and Carrim (2016)** South African Indian women – spousal support **Booysen and Nkomo (2010), Bullough et al. (2017)** Practice of male dominance perpetuated by cultural norms, and beliefs rooted in systems of patriarchy and filtered through social and organisational institutions **Ryan and Haslam (2005, 2011)** Dilemma of conforming to a female stereotype **Jaga et al. (2018)** Work-family conflict **King Miller (2017)** Perceptions about women in STEM	• Perception of self and the industry • Family support structure • Perceptions of women by the community/ society • Perceptions of women in engineering • Males engineers' perception of women engineers • Feelings of despondency • Desire to leave the profession • Lack of ample mentorship • Growth and opportunities – reasons to stay • Confidence and resilience • Emotional intelligence • Mentorship by male engineers (old school thinkers)	**Theme 1: Support and Encouragement in her personal space** • Support from family/spouse **Theme 2: Support and Mentorship in her professional space** • Organisational culture • Mentorship

Research Question	Key Literature Reviewed	Codes	Themes Identified from Findings
	Benet-Martínez et al. (2002) **Benet-Martínez and Haritatos (2005)** **Sanchez-Hucles and Davis (2010)** Biculturalism and ethnic minority women		
How does **social cognitive processing** inform South African Indian women engineers' decision to remain in their profession?	**Lent et al. (2000)** **Lent et al. (2006, 2008)** **Lent (2013)** **Brown and Lent (2017)** Social Cognitive Career Theory **Ryan and Haslam (2005, 2011)** Dilemma of conforming to a female stereotype **Carrim (2012), Carrim and Nkomo (2016)** Identity work – South African Indian women **Ahmed and Carrim (2016)** South African Indian women – spousal support	• Goal-setting • Need and hunger for success • To prove I can do it • Opportunity • Growth and development • Motivation from mentors, engineers and family • Self-motivation • Self-doubt • Confidence • Scepticism • Resilience • Vulnerability • Rational versus emotional	**Theme 1: The Resilient Mind** **Theme 2: Career Progression and Opportunities** **Theme 3: Tools and Mechanisms**

4.3 Findings

Findings will be presented under three main themes guided by the three research questions. These main themes are followed by sub-sections supporting them. Each question is hereafter presented as a statement.

4.3.1 Statement 1 – Identity and the bicultural context of South African Indian women engineers.

The stories presented by the participants—all South African Indian women engineers—weave a tale highlighting the challenges these women face in their bicultural lives. These are challenges in respect of their identities of race and gender, which they must navigate successfully in two very differing spaces, that is, their social and professional spaces, with the overlap of the two being the bicultural space. The main themes that were identified are as follows:

Main Themes:

Theme 1 – Negotiating and Navigating a Bicultural Identity

Theme 2 – Societal Perceptions about Women and Women in Engineering

Theme 3 – Male-dominated Space

4.3.1.1 Negotiating and Navigating a Bicultural Identity.

Within the main theme, negotiating and navigating a bicultural identity, the application of Indian cultural norms and values was dominant in the story telling.

Application of Indian Cultural Norms and Values

Most of the respondents were raised in traditional Indian homes. Their accounts of early childhood and adolescent experiences articulated a dichotomy of experiences in terms of homes that still adhered strictly to cultural norms (*cultural tightness*), to those applying a certain degree of *"subtle tightness"* to a family that applied a watered-down approach (*cultural looseness*). The researcher saw the latter as the rise of what can only be described as liberal-minded homes, based on the flexibility applied and platforms opened to these women in respect of decision-making power and freedom with regard to career choice.

This cultural looseness was evidenced through the experiences as presented by most of the 25 participants. These women described homes in which they were able to exercise their voices without restraint and where they were socialised with underlying value systems that supported the growth and development of women. Below are extracts from some of the participant interviews providing a verbatim account of their experiences:

For me, um, okay maybe how I should start this is by saying that I… I think I grew up with a very democratic and diplomatic family. Um having a mom and a dad and… and four brothers that… that really did not judge me in any kind of way, um, negatively at least. – PrEng01

My parents told me, um, we are not going to tell you what to do, um; it is essentially as long as it is a profession. – PrEng02

I think their bringing up and our move to Johannesburg. So we were not really surrounded by the norms of having family pressure of… on us. So even growing up, my parents were very open. There was no limiting that you will study this or do anything. – PrEng05

There was a very strong support from my immediate family and my extended family and this goes across my family for all of my cousins, um, that they are supportive of having education and women… women being educated. – PrEng06

My dad was extremely broad-minded and very encouraging, supportive. I was the first individual to have gotten their license…
In addition, he was retrenched and in that experience him, um, I was… must have been about 19 or 20 at the time and, um, he then signed over, I have literally control the whole house. He gave me power of attorney. – PrEng07

They were liberal, um, very much the same as… as… as what a male could do. Anything a female could do a male could also do. I mean anything a male could, a female could also do. Um, if I look at all my… my… my cousins, all of them that I… my… they all went… most of them went on to study further. – PrEng08

I was very lucky, um, because my dad supported me and my dad from the get go, um, he maintain that you had to have a tertiary education. …They were like 'nobody forced me to cook'. My gran… my mom's… my dad's mom lived with us. I didn't have to cook. I didn't have to do anything and I would come home from university and food is there. So it was wonderful. I had a sup… I had support from my immediate family. – PrEng09

They didn't impose any old Indian cultural things on us. – PrEng10

My family are quite, um, quite liberal. Also, um, bec… I think it's more related to how I am as a person… – PrEng15

Yes, they were very open-minded. – PrEng17

I think though my parents are a little different in that they were I think a little bit more liberal and not as strict when it came… To being, you know like the very orthodox Indian families. I think my parents were little bit… little bit, um, against the green when it came to the way they raised us in that respect. – PrEng18

While some participants advised they had the support of their immediate families, a few told of the negative attitudes of either one of their parents, of older people in their families or their extended family, in respect of their choice of profession. This they likened to infiltration of cultural norms that percolated into static perceptions about the gendered role an Indian woman had to embrace. Below are extracts from some participants' accounts of their experiences:

They're mostly modern-thinking. So, um, so with equality with men and women they are modern. Just, um, the older generation like my granny feel that woman should be cooking and cleaning and stuff like that. – PrEng14

…your extended family having expectations of what a… what an… what an Indian woman is supposed to be which is you know, um, quiet and respectful… And reserved and homely and, um, those types of things. – PrEng15

…so my mom… She wanted… she said, um, as a female you know you should have a profession which you can work from home… I mean firstly you… you're already, um, a bit of bad girl because you're choosing to go study like the man. You know like you lost cause already. – PrEng16

"Subtle tightness" was also evident where some families—although orthodox—applied an "unspoken negotiated approach". This midpoint saw respondents being able to choose their careers on condition that deliverables in respect of their gender and cultural association were met.

Below are extracts from some participants' interviews providing a verbatim account of their experiences:

> *Therefore, it was not, um, clearly defined in terms of what we should be as an Indian woman. However, I think there… there was definitely, um, you… you had to be able to cook and clean and all the domesticated… Um you know chores and that. Um, but my mother was very driven in pushing us to… to study hard and, um, have a… a profession and you know… Be independent essentially. However, were not very, um, blatant about, um, me doing certain things or if immediate and extended, but you do… it's… it's sort of, um, insinuated in a sense.* – PrEng02

> *So my rules at home they… what was expected from me, it wasn't clear… clearly defined. It was you know you're respectful. You'll complete your stuff. For me it was studying was important like when you finish school, you study. Whatever you wanna study, no one is forcing you. You study something and you become independent whichever way you do it whether if my mom's versions getting married and living with your husband or being independent on your own but… Essentially is what I… they never said it aloud, but… That's what I picked up.*
> *But he used to give us limitations like I remember it was our matric farewell. So you know your brother gets to go out to like 01:00… But you get to come home at 22:00. I said: 'Pappa, it's unfair. Like you all about equality.' He says: 'But you have to understand that because you're a female you're more to prone to these…'* – PrEng10

> *So very traditional, um, and, um, obviously, um, my mom was a housewife and a lot of my aunties were as well. So, um, they made education the forefront for us and, um, my dad worked hard so that we could actually get, um, you know opportunities to study and then made… made it clear that we should be financially independent. I mean we are three sisters, um, and, um, they wanted us always to further education but obviously still seeing the men as the more predominant figure… And, um, you having to be supported by a man.* – PrEng11

> *So yes you can study but you need to also tick off these boxes a, b and c. You need to be able to cook. You've got to be able to you at some point you need to be… to get married and it doesn't matter if you've got a career, you need to do a, b and c. …this unspoken, um, part that where society comes in and society expects a woman to look in a certain way and to act in a certain way and to… Be able to do certain things whether it is carrying a tray perfectly.* – PrEng12

The cultural tightness imposed on two participants was evident from their accounts of how cultural/religious affiliations fed into the application of value systems. This placed them at a disadvantage resulting from their gender and negatively affected opportunities presented to them by their place of employment. The participants advised that these restrictions placed on them created in the minds of their employers a perception of their unwillingness to embrace new opportunities and an inability to balance work and family responsibilities. This is expressed in the extracts from their storytelling below:

> *…in a Muslim school, if there's very much like the expectation was really the children be a wife and a mother. There wasn't any real future after that.*
> *And my family were very opposed to it because they said: 'You know that's not something that girls do and you know it's a male industry'. Yeah, because you understand our cultural issues as well because… Because our… our male counterparts whether it's your dad, your husband… they all very much, 'Oh well you should be at home and you should be like cooking, looking after kids', and you know like…* – PrEng04

> *…there were times when, um, when I need to travel …and being a female Muslim… Um I'm supposed to travel with somebody. With him … with my husband, brother, father, someone. I… I had to… I had to give up a couple of trips because there was nobody to go with me. In fact, I travelled once or twice without anybody.* – PrEng12

Out of the total 25 participants, 23 described their families as being strongly supportive. Only two participants advised otherwise.

4.3.1.2 Societal Perceptions about Women and Women in Engineering.

Within the main theme (societal perceptions about women and women in engineering), dominating the participants' storytelling was the prevalence of perceptions of gender rather than race and a

gendered understanding or a lack of understanding of the field of engineering by family and community.

Perceptions are gender- rather than race-focused

Participants were asked how they felt about entering the world of engineering as Indian women. The general feeling was that their gender, as opposed to their race, informed the challenges they faced in the workspace. They based this on the fact that what they were experiencing in the workplace was something they knew all women faced. It was not unique to Indian women. Even though this identity tag of gender was, for many participants, a non-obstructive tag in their personal space, it presented as the challenge in their male-dominated professional space.

PrEng02 stated:

> *I don't think there was any, um, it wasn't related to being an Indian. Like there was… there's nothing that I can recall that was specific to me being an Indian engineer. Um, I mean I think the female concept came into play, um, but not necessarily Indian.*

Three of the 25 participants related through their experiences how not just their gender identity, but also their race, worked against them in their professional space. PrEng09 stated:

> *…I did have one manager, um, who I felt, um, targeted me because I was Indian and he was Indian as well. Um, and he's the only manager that I've had an issue with. I actually left that position… because of him. You know at first I thought it was only me and then I realized after speaking to, um, as recent as this… this year speaking to someone, an Indian woman working there, he treated her the same. He treated the Indian employee… female Indian employee, very different from everyone else. Then I thought, maybe its females. Then I saw his interaction with the other woman and she was a Black woman and, um, younger than me, junior, um, in a position junior to mine… and he treated her as he would treat any other person there.*

PrEng11 stated that when she joined a Black-owned consulting firm, she encountered a lot of intimidation from the HR manager, a Black male. PrEng11 felt it was her gender as well as her race that made him behave in a certain way, given Black cultural beliefs about the role of women and their similar nature to the value system of Indians in terms of patriarchy. PrEng11 stated:

> *They didn't like the fact that an Indian woman were around or felt intimidated by it.*

PrEng06 stated:

> *But when I stepped into construction, it was… that was the first time that I've experienced direct racism. But I couldn't work out if it was racism, ageism or sexism. Because I fit the bill for all three.*

A gendered understanding or a lack of understanding of the field of engineering by her family and community

Participants stated that in their personal space, family and community did not know much about engineering and those that did had a one-sided, gendered view about the profession. Admittedly, this was a male-dominated profession, a fact that has carried through and informed the way people view engineering as being something only men can do. For some participants this perception led to comments or judgement by family or community that painted the participant as a rebel or outlier to the norms and value systems that had been adhered to for eons. This most often caused challenges for participants in terms of navigating their identities in a bicultural space in a way that did not disrupt either space. PrEng16 stated:

> *My grandma has asked me 'if I'm gonna be making glue in a factory?' Cause she heard of an engineer that works in a Pritt factory. So she's like 'are you also gonna be making glue?'*

PrEng20 said her grandmother thought an engineer changed streetlights. She stated:

> *My grandmother actually thought an engineer was somebody who works at the Municipality and*

changes lights… street light bulbs.

PrEng15 said:

Then you're like 'no I don't do that kind of engineering'. Then I… like I… I'm at Weightwatchers, and they're like 'oh you fix toilets'. And I'm like 'no, I don't fix toilets'.

These statements are indicative of the lack of understanding many have about this profession. Moreover, there is an assumption that because engineering was male-dominated, the work is not doable by a woman. Some participants also saw this more as concern from their families about the conditions under which they as women would have to work, given that the space was dominated by males. PrEng19 recalls what her father said to her when he fetched her from the work site. He said:

You know what, I felt so sorry for you because you had this big bag. You had a pick. You had a hard hat. You have these boots and you had like all this tools with you and I was thinking: What made you decide to go and do? I'm like no dad, I enjoy it, you know.

Participants labelled three careers for Indian people that were perceived in the Indian community as high-ranking. Some participants' parents tried to convince them to follow careers in medicine, law or commerce. The way participants described this need felt by their parent/s (to choose one of the three preferred paths) suggested such choices would ultimately make their parents appear superior in the Indian community.

4.3.1.3 Male-dominated Space.

Within the main theme (male-dominated space), central to the storytelling process was the prevalence of macho culture and site-versus-office-based experience.

Macho Culture and Old White Boys Club

All 25 participants spoke about the dominance of males, and more specifically White males, in the industry as problematic for women in general irrespective of race. This they attributed to the presence of the "old White boys club" or macho culture that participants attested persists to the present day. Participants articulated feelings of isolation and exclusion, which they viewed as subtle tactics applied by their male counterparts to make the environment so unbearable that they would choose to leave the profession. Some of the challenges these women articulated ranged from their voices being silenced in engagement sessions with male counterparts, to having to work twice as hard as their male counterparts in order to prove themselves worthy of being accepted by their peers.

Extracts below point to the prevalence of White males in the profession and how this inevitably affected a participant's navigation within her professional space. This is blatantly evident from the next two extracts, where women had no option but to satisfy the needs of clients, even though the ideas or innovations were theirs. They had to send what they labelled as "the right kind of messenger", just to get buy-in from the client. This, they stated, was due to the age-old perception that stemmed from the time when only White men occupied the engineering space. So the perception was that a White man, as opposed to a woman or a woman of colour, had more knowledge and capability.

PrEng04 stated:

> *You know, when he came on board I almost felt like he gave me credibility… Because then people would actually say: "Oh ******, you know like you got a White male and maybe you're doing something.*

PrEng06 spoke about how she managed to deal with the fact that her clients did not listen to her or take advice from her because she is female:

> *I currently manage the fact that my client doesn't actually like to listen to the things that I say, I don't say it. What… what I've done is I've stepped back and I send them the right type of messenger… To make the same statement. Because at the end of the day… My job as a professional under my company's name is to make sure that the company provides the right advice that the client must listen to and if she doesn't want to listen to it from me, that's fine.*

The mechanism she employs in this scenario involves securing the services of someone who will go to the client and convey her advice. This person, she said, fits the criteria for what it takes them to listen. PrEng06 stated:

> *I'll just pick the right person who would say exactly what I want them to say, but she'll hear it from them. I basically hired my boss. So my boss retired… And I said to him: 'Come join my project', and he said: 'Cool', and then he's White, he's male and actually I say this to him, I say to him '*****, I need you to go in and this is what I need you to do'. He says: 'Why?' I said: '…because… They're gonna listen to you cause you're White and you have grey hair'.*

PrEng04 described a job opportunity she missed out on because of the environment where she would have been expected to work, and how this benefitted the successful incumbent because of his gender. PrEng04 said:

> *Actually when I first, um, started going for interviews, I went for a job interview once and, um, due to the fact that I was a young Indian woman at the time, I didn't get the job due to the site having elderly male workers that and I later found that that, um, male from the same class as I got the job.*

PrEng01 and PrEng11 related experiences where senior male engineers candidly spoke about women in the workspace in a derogatory manner. PrEng01 said a senior White male engineer told her: *'You are worse than a secretary'*. PrEng01 advised that this was indicative of the gendered thinking around jobs that were suitable for men and those that were reserved for just women.

PrEng11 said:

> *When we got interns there, they were actually lower in job than me because you get interns but we were permanently… no not permanently, but contractually, employed. And he actually told them directly that 'women belong in the kitchen'.*

PrEng11 stated:

> *I'm sure even SAICE itself, I mean SAICE has been in the news for being very, very male-dominated. I mean it was horrible. When I started volunteering you only saw White male, very aged men… at conferences, meetings… workshops and it is the old boys club still… but now they will stop and greet me. They will attend my… my conferences, attend my workshops because they know they have to… because myself and a lot of other women had made it clear that we will not put up with that… and we won't allow other women to be put up with it and we're not going anywhere… because a lot of women resigned from SAICE because of it.*

PrEng11 advised that in her first job, the shoes she wore were the determining factor that according to her boss meant she was not suited for the career. PrEng11 stated:

> *My first boss, um, actually judge me for the shoes I wore and, um, told me that I was too well-dressed for, um, engineering. In this profession—and it is very, very male-dominated, more especially White male-dominated—and it's something that still needs to change."*

Coincidentally, PrEng03 commented about this gendered thinking or perception that men in this space had about women, so that even how a woman dresses could render her unsuitable for this field. PrEng03 stated:

> *Because you've got a huge bull's eye on your back already because you're a woman… and then now you rock up with the high heels and a handbag and then immediately men are gonna think you're stupid. It… it's there. It… that's what it is.*

These are just some of the extracts taken from various stories. It is concerning that; this type of racial or sexist victimisation has affected the majority of participants during the course of their careers. Whether subtle or extremely blatant, it is still prevalent. PrEng18 was perhaps one of the few outliers who had been exposed to this type of male chauvinism but was able, as she stated, "to roll with the punches". She did, however, acknowledge that there was definitely a clear disparity in terms of men and women in the engineering space.

Site experience versus office-based experience

Participants who were placed on-site described their experiences of alienation, victimisation, isolation and fear, with some of them having to endure incidents of verbal and sexual harassment. PrEng10 stated that when she approached HR, the response she received confirmed that this sort of behaviour was not something unheard of; worse, it was accepted and not dealt with. In a strange way, one could state that organisations allowed this rite of passage to exist as one that a woman must undergo, irrespective of how it affected her.

PrEng10 stated:

> *And then, um, I spoke to the HR lady and she says: 'No man, this is just… this is just part of it', and she explained to me, cause at that point I couldn't tell what is a T12 or what is a technician, what's*

an engineer whatever. In addition, she explained the hierarchy of things and she explained to me: 'Okay, this is why you guys are treated like this. Just bear it. You know it is… its okay. If they're… if they're overdoing it, let us know…'

In her storytelling relating to her site experience, PreEng06 gave an eagle's eye view into a woman's experience in this space:

I then spent three years on a construction site and that's literally when the penny dropped for me because I went onto a construction site where, and I spend three years on it, where I looked when I put a baseball cap on my head, I look like I was 19 or 18. I was the assistant engineer on site, which means that often I was the smartest person in the conversation. However, I look like I was 18. In addition, I was the person giving an instruction… To people who are been doing the same thing for the last 30 years. So that… It was an extremely difficult space to be in and coming from an environment where I went to an ex-Model C school. So I was exposed to a wide range of races and cultures. Therefore, we never actually saw race… We didn't see it at all. And then I went to a uni… University of Cape Town, where again race wasn't a thing when I was at university. We didn't see it. And when I started working because I… my first two-and-a-half years was in an environment with the people I happen to work for and I use those words quite carefully… Didn't see it either or prepared to not make it an issue… But when I stepped into construction, it was… that was the first time that I've experienced direct racism. But I couldn't work out if it was racism, ageism or sexism. Because I fit the bill for all three.

Describing her experience on-site, PrEng13 stated:

Um they will tell you they were leaving at a certain time, you know, like 'We're gonna go out to site like say at eight o'clock'. But they would leave me at half past seven. So work me out, you know, and, um, when you go to site they, um, basically don't wanna teach you anything. They literally would, um, in a lot of cases they would take the male engineers… Um, irrespective of gen… a colour… They will take them and show them and teach them but with me they would sideline me, always try to… I don't know, keep me in my place. I don't know what it was. But they would leave me and I'm… tell me to read books or watch videos and… That kind of attitude.

PrEng16 stated:

> *I know of the one story, and that shook me, was that one of the woman, um, were dressing like sort of bigger clothing and, um, no make-up or anything to try and look a bit more male on site. Yes, so that, um, you know, she's avoid[ing] those glances and all of that. Take their attention away*.

PrEng18 stated:

> *It's not so much the office space, because I think people are quite… quite, um, what is the word, put together when it comes to being in an office space as opposed to be around on site. Working out on constructions—and I've done this and I've seen it first hand—I mean it's a… it's… you know, there you see the disparity between, like, you know, male and female*.

PrEng19 stated:

> *On the construction site and all of that you are still seen, you know, as a female and most of the… the people don't want to listen to a female. That's a fact…*

For some of these participants their experiences were traumatic – defining moments that made them strongly consider leaving the profession. They felt they were between a rock and a hard place in terms of trying to navigate between their personal and professional spaces, and this led to them questioning their choice of career.

It was evident from the story told by PrEng02 that she was quite aware of the happenings on-site when she stated she kept asking her future employers: "*Where are you gonna place me*?" She said: *"Cause I was… if… if it's a construction company... I was scared they're gonna put me on a site in the middle of nowhere. Um, luckily I… I got, um, placed in a team…"* What is interesting is the vast difference site- and office-based placements offered to participants. Many who were on-site eventually did join a more office-based space and though perceptions remained of their

identities of gender and race, these were not as blatant as the site experiences. Some participants never went on-site and their corporate environment experiences in the office space were completely different to those who were on-site – less rough than those of women on-site.

4.3.1.4 Conclusion.

Findings presented in relation to Research Question One of this study—offered in this section as Statement One—spoke to the identity and the bicultural context of South African Indian women engineers.

A connection between the level of application of Indian cultural norms and values, that is, cultural looseness, tightness and subtle tightness, was noted, and how such applications inform the negotiation and navigation of a bicultural identity for a South African Indian woman. It was indicated through participants' storytelling that gender, as an identity, took precedence over race, with the first tag informing societal perceptions about them in their workspace. Participants felt these perceptions inevitably fed into the way women in engineering were perceived. Their gender listed as the dominant identity tag driving the social narrative of what society created and normalised as socially and culturally acceptable gendered roles. Given that men dominated engineering, it is still perceived, by most people, as a male profession and this type of thinking places women there under scrutiny. This gendered approach to roles, and what is accepted and not acceptable culturally, becomes much more real for a South African Indian woman engineer in her occupation of a male-dominated space. Participants confirmed the prevalence of macho culture and the way this macho culture exuded on-site as against in the office.

4.3.2 Statement 2 – Bicultural context and South African Indian women engineers' social cognitive processing.

Self-efficacy refers to one's belief in self. In a bicultural space, one is exposed to motivators or de-motivators triggered by differing contexts. The experiences in these differing contexts, filtered by identity tags, percolates from early childhood, into adolescence and adulthood, and influences social cognitive processing – the way people think or their minds work. These experiences and the social cognitive processing they involve have the power to positively or negatively influence levels of self-efficacy. The main themes that were identified are as follows:

Main themes:

4.3.2.1 Theme 1 - Support and Encouragement in her Personal Space to build Self-Efficacy

4.3.2.2 Theme 2 - Support and Mentorship in her Professional Space to maintain Self-Efficacy

4.3.2.1 Theme 1 – Support and encouragement in her personal space to build self-efficacy.

Within the main theme, support in personal space, a paternal/maternal motivator, a supportive spouse and growth in levels of self-efficacy were dominant in the storytelling.

The Paternal Motivator

Participants stated that family support was a major contributor to their aspirations of becoming engineers. Particularly interesting were the responses received from some participants when asked what motivated their career choice. They nominated their fathers as the motivation that steered their choice of profession. Most of these participants' fathers were in a professional field. Two were engineers, some were directly linked to the engineering field and others worked in various other professional fields. Participants stated, as per the extracts below, that their fathers supported

and encouraged their decision to become an engineer. This type of support, they advised, made it easy for them to navigate in their bicultural space with no gender-driven reservations. Below are extracts from some of these participants' life stories in which they list their fathers as motivator.

> *It was my dad. Um, he… He… he did career guidance counselling and he were taken a… a group of kids to a career day… and he saw there's girls pondering over circuit boards and things and he said he just pictured me doing it.*
> *Um, I was encouraged to do it especially by my dad who wanted me to be independent, you know. Took me out. Showed me how to change a tyre. Made me do things with him. We fix things together.* – PrEng08

> *And my dad was a 100 percent. He says: 'Understand, these are the… the holdbacks, or these are the negatives, these are the positives'. You're happy with it, you go ahead.* – PrEng10

> *I'd say my dad… my… my father, you know, had… well, just the two of us. There was no sons and I'm the oldest… So I was like his shadow. And he's a mechanical engineer by profession, so… Always think out loud and was you know experimenting in the garage, had a lot of tools and things… Quite a handy guy. So I was behind him all the time watching. Subsequently developed a… a… a MacGyver touch… Similar to him. So yeah, I'd say the profession helped me quite heavily on… on that aspect.* – PrEng18

> *In fact my… my… my dad encouraged us in that direction.* – PrEng22

One participant conveyed a slightly different story. Her father was initially not supportive of her choice and tried to convince her to choose other career paths. Her decision to choose engineering led to him not talking to her for a period of time. PrEng20 stated:

> *Um, so strangely enough my dad and I didn't speak for about a month because… he was quite upset that I decided to choose the engineering, um, career instead of anything else that, um, he had recommended.*

What was noteworthy about this story was the participant's ease with which she stood her ground. Her refusal to be swayed by the norm that most often silenced many female voices – the patriarch. Her father eventually did accept her decision, as she explained later.

Four of the 25 participants listed maternal influence as a strong motivator.

> *My mother was very driven in pushing us to… to study hard and, um, have a… a profession and, you know.* – PrEng02

> *My mom, if you see her now, she's like a tenth of the woman she was. But she was phenomenal. She worked for Standard Bank. She was an insurance sales lady. She wore a sari everyday to work. And then she fought Standard Bank South Africa to wear her sari. So that's the kind of role model… I had.* – PrEng03

> *She was an independent, a very strong-minded then. It turned out she made all her daughters the same way.* – PrEng13

> *Then my mom was always, um, the open-view person to say: 'You know if you wanna test the boundaries, why not? And whatever you choose, you know. We'll support you', kind of an approach.* – PrEng25

Clearly evident from the stories these women shared was the connection between family members, specifically parental support and the impact it had on building their levels of self-efficacy. Some participants stated that their mothers and other females in the family, extended family and community were less supportive of their career choice. When probed about what they thought made these women behave this way, participants attributed it to historically entrenched cultural norms that painted the Indian woman as a docile, submissive, subservient homemaker.

Participants stated that this unwillingness to accept their choice of career was based on a gendered understanding of engineering being a man's job, coupled with their perceptions as Indian women about the role of Indian women. These perceptions were informed by their histories of subservience and subjugation as a way of life for them as Indian females. Having these women in the participant's life placed them in a situation where navigating their identities against the expected norm was judged. This affected participant' psyches. Extracts below describe the experiences of some participants.

> *My mom is the more, the traditional, um, viewpoint where she couldn't really understand why I was doing engineering. She couldn't even understand why I still wanted to work after… she's like: 'Oh you can just like get married and relax'. It's fine to have your independence. Like go buy properties and do something where you get a passive income. Why are you working? So it… it… it was… it was interesting, cause nobody, um, forced anything upon us. In our family we were opened, like, I married Coloured person years later. First person in my family to do that. My mom did not talk to me for two months.* – PrEng10

> *The older generation like my granny feel that woman should be cooking, cleaning, and stuff like that.* – PrEng14

> *When I started studying but my grandma was like: 'Oh, you have good result, why don't you be a doctor?' Um, 'Why did you pick engineering?' You know.* – PrEng15

> *So I had to leave my daughter. So I'm fortunate that I have a support system like my parents… That are quite close to me, that I could leave my daughter with. But you still get that… you know how it is with your moms and your mother-in-laws and all of that. They would make remarks and say: 'If you left your child to go, how can your husband look after?' But this day and age has come to a point where both husband and wife… Indian or non-Indian, but I think with the Indians it's basically that you know the males are always given the… the… the… the preference.* – PrEng19

The Supportive Spouse

Interestingly, four participants—PrEng25, PrEng20, PrEng10 and PrEng09—were married to engineers. These participants advised that sharing the same careers as their spouses assisted in a common understanding of the pressures of the workspace. The husband of PrEng03 is in a similar field to her and is supportive. PrEng03 stated '*When I started my work and all of that stuff. Therefore, he is very, very supportive and me in similar fields. So when I get stuck I phone him.'* These women stated that the understanding and support they received from their spouses, based on a common understanding of the tough, male-dominated playing field, was instrumental in keeping them motivated to remain in their profession. Most participants' spouses were not engineers, but did have professions of their own, and they still provided support and encouragement to their spouses. To these women, such support made a massive difference and gave them the confidence to navigate between their bicultural spaces with little or no pressure with regard to gendered roles coming from their personal space. This support reinforced their levels of self-belief and positively influenced and maintained high levels of self-efficacy.

Two participants told a different story, one involving unsupportive spouses, power struggles, subjugation, manipulation and violation. PrEng13 described the toxicity she experienced in her marriage because of her spouse being unable to accept her as the breadwinner. Her marriage ended following his attempts to isolate and disempower her. She stated:

> *So once I started working, I started me being independent, I was earning money and basically I was supporting us for the two years that we were married. So it was very difficult for him, um, especially being from an Indian background, you know. They… they feel like they be in charge of everything and I'll be honest to you, he isolated me from all of my friends, my family. I wasn't allowed to, um, okay, I'm sorry about the personal stuff but, um, this is what happened you know. Um, so anyway we, um, he couldn't really handle me doing everything.*

PrEng04 referred to the current unstable nature of her marriage and the discord it brought that was linked to her professional status and financial empowerment. She said:

> *…and in my situation my husband is very like … it's always like this conflict, you have a business but then… but then it's like: 'Why do you do this esteem like that? And you taking away from your kids and… You're a bad mother and bla-bla-bla… I think he's… he actually wants to divorce me and he actually like – he walked out on me a few weeks ago. And… no it's fine, and then he came back. And I think I… I manage it very badly because you know I get angry with him. He's not working at the moment. He hasn't [had] work for the last four months or five months.*

With these scenarios, the researcher noted the struggles women faced navigating their bicultural space. Particularly evident was the infiltration of gendered role expectations of the male counterparts of these participants. In addition, how culturally enforced norms dominated the thoughts and reactions of the men when these women shifted the dynamics of what was deemed the norm, where a man works and provides, by becoming through their profession, financially empowered. This clearly did not sit well with their spouses and inevitably placed strain on the marriage of PrEng04, while ending the marriage of PrEng13.

4.3.2.2 Theme 2 – Support and mentorship in her professional space to maintain self-efficacy.

Within the main theme, support in a woman's professional space, the silent organisation, mentorship and maintenance of her levels of self-efficacy were dominant in the storytelling.

The Silent Organisation

Participants described challenges faced in the workspace that they viewed as being a direct resultant of their gender and roles deemed to be assigned to women in their social space that fed

into the perceptions arising in the workspace. These perceptions presented themselves in what became an unsupportive, silent organisation. Some participants were the first woman engineers in previously all-male teams. Challenges they articulated gave instances of verbal, physical and sexual harassment, insubordination, alienation, isolation and deliberate exclusion.

Participant PrEng10 described her experience as a first-time mother. Her company policies did not allow for leave that would permit a parent to execute parental responsibilities for a sick child. On a few occasions, she was told candidly that unfortunately there was no such allowance in the organisation's policy. Even when she had given birth, and had returned to work, she was forced to express her breast milk in a lavatory until her manager advised her that she could use his office, where a small fridge was available for storage.

The story of PrEng10 is one that speaks to the woes of motherhood she experienced. PrEng10 stated:

> *The one thing that really hurt me was the whole maternity leave thing. It's… it's almost frowned upon. It's like, um: 'Why do you need six months?' For them is like: 'Oh, you were relaxing for six months'.*

She related incidents that displayed a total lack of gender sensitivity, understanding and support when she returned from maternity. PrEng10 related:

> *When I came back I'm still expressing milk. There's no like facilities to express milk. So then I have to drive home to express milk. The company as a whole has a zero regard for mothers especially.*

PrEng10 felt the policies of her employer weigh heavily against the role expectations of women when they enter motherhood. She stated:

> *Right now I'm having an argument with my manager about leave because, um, the kid. So like they don't care right 'cause when the kids are sick, their wives and the nannies sorts it out. They don't even understand what's going on.*

The stigma attached to motherhood was not an experience unique to only PrEng10, with PrEng03 stating that at her place of work, her pregnancy saw the rise of snide comments about her "extended vacation". PrEng03 stated: *'But I've been… I've had comments from the time I was pregnant, like: "Oh, you're going on a six-month holiday".*

PrEng16 spoke about how her voice was allowed to be heard in meetings internal to the organisation, but as soon as outsiders were involved, her voice was silenced or ignored. PreEng16 stated:

> "*The only times that I did feel it was when you were going to meetings. In the… in the company, I was very comfortable. I was able to like, speak and voice my… But I've got… and… and sort of they knew me, they knew my capabilities and… and all of that… But what happen to… in… when we would go out into meetings at other organisations… And then I've end[ed] up being the only female in… you know, like in that meeting of 20 men… And you know a lot of macho culture… And I'm the only female and sometimes it… wow… it did happen a few times that you're the only person of colour as well… And then you realise that no matter what you say, it is overshadowed… Whether you're right or not.*

PrEng21 related how a male manager called in a senior female to tell her not to voice her opinions in the meeting. Another incident involved a female co-worker raising a complaint about another female staff member. When the complainant approached her male manager she was asked if it was a case of her just being emotional because there was another female now in the team, or was it just jealousy? PrEng23 spoke about the blatant wage disparity. She stated that she had it on good authority that a White male engineer who started after her with less experience was earning

more than her. PrEng06 stated that ageism, sexism and racism were still prevalent in the workspace.

PrEng11 related how her male White Afrikaner manager almost physically assaulted her just because she was taking a call when he entered her office. PrEng11 stated:

> *When we got interns there, they were actually lower in job than me because you get interns but we were permanently… no not permanently, but contractually, employed. In addition, he actually told them directly that 'women belong in the kitchen'. In addition, it is not the first time I… I would have heard that in my career*.

PrEng11 recalled an incident where she was prey to sexual harassment and stated:

> *I mean, even when I was on construction, I had the Chief Resident Engineer tell me that, um, 'woman belong in the kitchen', directly to my face. Hit me on the ass a few times because he felt like that he could.*

Further to this, PrEng11 stated:

> *I have also lost the will to fight, especially when my Chief Director didn't stand up for me. If you work for a company for eight years and they still don't see your worth… then you know… It's not… no, it's not worth it.*

Such bad experiences twice caused PrEng11 to quit jobs where she had given much of herself, only to leave because her organisation remained silent about the victimisation she was experiencing. PrEng20 stated that policies in her organisation were not gender–sensitised: instead, they were generalised. This is problematic, especially when a woman enters motherhood. PrEng20 asserted that organisations failed to take cognisance of the navigation required of a woman to maintain balance in her home space where it is "expected" she will be the caregiver to

her children, and still hold a demanding professional post where an organisation expects her to work on a par with male counterparts.

A majority of the participants emphasised the haunting silence some their organisations maintained even in the face of such incidents. This silence injured and broke down their levels of self-efficacy. They expressed disappointment at the lack of support they received in this space. The irony they described was almost tragic, in that the space where they would have expected to have been subdued and shackled by cultural norms and value systems because of their gender and racial tag was one where they had found support that cultivated high levels of self-efficacy. Their entrance into the professional space, on the other hand—a space where they expected a genderless culture to apply—was the very same space that negatively affected their levels of self-efficacy because of gender-driven, and in some cases race-driven, experiences. Some participants felt it was not worth their time to lodge a complaint or raise these matters in their organisations. They felt this approach would only single them out, incite unpleasant reactions from their peers, and the organisation might limit opportunities for growth and career mobility. It was concerning to note that far too few participants expressed satisfaction with their work environment.

Mentorship and Role Models

Eight of the 25 participants advised that they were mentored, with one participant receiving professional coaching. Eight of the nine mentors were men. The eight participants explained how having this mentorship aided them to build confidence in their professions and, to an extent, was key to them being accepted into the community by other male counterparts. The one participant receiving professional coaching stated that as a CEO of her consulting company, she needed

guidance and support on how she managed her personal and her professional spaces, to maintain a good balance. Moreover, the coaching assisted her to have a much less-emotive psyche and this helped her to make wise and rational decisions pertaining to her consultancy. The remaining participants did not speak much about mentorship, although a few alluded to acting as mentors in their space to young engineers, new to the field, who became their mentees.

It was evident that mentorship was a rare occurrence, a personal choice by the mentor to impart his knowledge and not something grounded in the workspace as a definite tool that women and men who joined the community were afforded. PrEng01 stated:

> *So I actually haven't had a personal experience where I've gotten to work with senior female engineers. Um I've worked a lot with males. Senior engineers... Um, some have adverse reactions to you and others take you and run with you to the goal post.*

Mentorship's success in tapping into the already built-in levels of self-efficacy of mentees, and driving the maintenance of such levels, made this tool attractive. PrEng07 stated:

> *I did however ensure that I had the excellent mentors throughout my career... And it's for that reason you know I can, like, confidently speak, go into a meeting and speak about any subject within… within civil, in structural engineering, because I had excellent mentors*.

PrEng14 stated that her mentors motivated her and that:

> *Just watching them and is it… inspiring to one day, you get to this stage where you have so much of knowledge and experience, you are able to help*.

Describing her mentor, PrEng05 stated:

> *She's had a lot of experience and a lot of similar experiences. And only—I think three weeks ago—she became my manager, but even before that, um, I think she started inherently mentoring, not knowing… and I think that actually made me feel a bit better in the career.*

PrEng12 described the close lasting relationship that she and her mentor continued to share. She stated:

> *I may not have had a female manager but my… my… my manager was like a mentor and I was lucky to have him. He's a good manager… and such a good mentor. In fact, I can phone him up now and say: "Listen, I need help here. Can you explain what's happening here". Or even if it's not on a technical level.*

Some of the remaining participants made comments suggesting they would have liked to have experienced this sort of mentorship. PrEng06 said:

> *So it was a little bit daunting because when you… when I did my undergraduate, um, it was all about technical and understanding, um, you know engineering and I often thought to myself: 'But I really wish I'd been mentored before I stepped into the field'.*

4.3.2.3 Conclusion.

Findings presented in relation to Research Question Two of this study, offered in this section as Statement Two, spoke to the bicultural context and South African Indian women engineers' social cognitive processing. Two main themes presented, namely, support and encouragement in a woman's personal space to build self-efficacy and support, and mentorship in her professional space to maintain self-efficacy. To reiterate, self-efficacy refers to one's belief in self, while social cognitive processing refers to how people think or apply their minds. Questions posed in this part of the interview schedule sought to elucidate a South African Indian woman's application of social cognitive processing in a bicultural space and her levels of self-efficacy.

What was evident in the findings was the power that support structures within a bicultural space had on positively or negatively influencing social cognitive processing: this in turn built or broke

levels of self-belief/self-efficacy. Twenty-four of the 25 stories told of supportive family structures and the impact this had on their levels of confidence and belief in self. This build-up inevitably drove their career trajectory. Maintaining those levels proved for many to be a challenge, because of the negative experiences around their identity tags of gender and race. These experiences activated social cognitive processing that resulted in a flight-or-fight response.

The *fight* response was the least likely option, given the silence these women saw their organisations exude in gendered, or racially driven, work scenarios. Very few participants indicated satisfaction with the professional space. It was apparent through their storytelling that identity tags of race and gender still disadvantaged them as women in their professional spaces. However, the support they received from their personal space sustained a positive cognitive processing and prevented the withering of their levels of self-efficacy.

4.3.3 Statement 3 – The decision to remain within the engineering field.

Participants shared traumatic and sensitive experiences from their personal and professional spaces that made navigating between these two spaces, and bringing balance to their bicultural space, a mammoth challenge. Yet, through all of these accounts, these women remain motivated to continue in their chosen career because of the reasons they list through their storytelling: these involve survival, opportunity and financial freedom/empowerment. The main themes that were identified are as follows:

Main themes

4.3.3.1 Theme 1 – Survival Mechanisms

4.3.3.2 Theme 2 – Career Progression, Opportunities and Financial Empowerment

4.3.3.1 Theme 1 – Survival Mechanisms.

Participants shared what served for them as tools and methods influencing their decisions to remain in their profession. Within the main theme, survival tactics, goal setting and networking, emotional intelligence and resilience were dominant in the storytelling

Goal Setting

Some participants as driving their action behaviour in their personal and professional spaces described setting and achieving goals. The presence of these goals created a desired trajectory: each milestone that was met, became an impetus to stretch themselves to always achieve and secure success. Below are extracts from some participants' stories about their application of goals.

> *For me, I believed in maybe not too many long-term goals… but micro-goals are key for me.* – PrEng01

> *I have this overarching goal to always be independent, um, and… and that too, independence comes with financial independence… Not having to rely on anyone and have… enjoying being an equal partner… In a relationship. Um, and in… in the parenting unit. Um, not having to rely on someone else. That is what motivates me. The fact that I can do things on my own, I do not have to wait for someone else.* – PrEng09

> *If you really, um, if you really want to get where you need to get, so in terms of the goals that you set for yourself… like I think it's my own personal, um… Goals that I wanted to do this. I wanted to do this well until I'm done doing this and then I'll do something else.* – PrEng10

PrEng20 advised having goals within the workspace as a method of managing or dealing with feelings of negativity there. The aim was to focus on the goal alone and in this way, the positivity experienced when the goal was achieved outweighed the negativity exuded in the professional environment.

> *As long as your… your end goal what you wanted to achieve has been achieved… You don't have to have the last say. So I think… I think over the years that's the biggest thing that I've learnt is… I don't have to have the last say… As long as my goal has been achieved at the end of the day.* – PrEng20

What is telling in the above extracts is the participants' usage of goals as a way of mapping out a trajectory, whether related to personal goals or goals that feed into professional growth in the work environment. It forms a type of work-in-progress vision board, making reference to goals set, goals achieved and proposed goals to be achieved.

Networking

Participants spoke about the importance of networking and how this exercise proves beneficial in providing support through groups. It can be likened to a buddy system, or a group that affords a platform or session to share frustrations with others who have suffered similar experiences. These groups also become an opportunity for presenting oneself as the voice of reason, and participants, through their exchange of experiences, may even find amicable solutions to what may have initially appeared something that they were unable to resolve or overcome. Below are some extracts from stories that participants related about networks or support groups:

> *I have a fairly strong network beyond the core.* – PrEng06

But at work for those four hours, I was solid. Then I go for an hour lunch where I could call whoever. I make vent about what just happened and then I go back for my next four hours. – PrEng10

And I think that's the first piece of advice I would give young kids. For others, [it] would be to seek out external support. And others in the industry, and to always be in a network. It gives you this support that you… because it's something… a tool that I never used then… Because I didn't know it… it was there… For me to use. And it… young people are more aware of this tools because they are more actively involved. And they have to work harder getting jobs. So I think, you know, to be in a network is probably the best advice I could give them. – PrEng11

So I have a group of, um, other engineers… it's another female and a male, so we… we kind of been… been friends for years… we use our group as a complaining session… Because other people don't always get it… We complain and we'll like: 'Okay, maybe we should try and do this', then we motivated each other to like… You know, move forward and try this solution or whatever… supporting each other has helped us stay, um, focused in this field itself. I think that has been one of the major things that's kept me going and motivated. So I will encourage anybody… everybody to have a group… Speak to somebody else that can understand what you're saying and, um, you don't feel judged about… – PrEng21

Emotional Intelligence and Resilience

These two ingredients—Emotional Intelligence and Resilience—were crucial survival tools that participants stated women had to harness in order to manage the challenges they would inevitably face in the engineering space. PrEng07 described this as a process of wiring and rewiring, where there is introspection or a type of self-analysis. This self-analysis, or questioning of one's social cognitive application, is when emotional intelligence commences and the build of resilience begins. Below are extracts from participants' stories in answer to interview questions about their coping mechanisms, which they could share with others as survival tools.

Um and growing… growing that confidence and resilience helped me, um, gauge that… This could be a field that I… I would love to work in. I believe… and… and… and people have said to me as

well: 'Don't, um, don't take things personally', but if… if you don't attach emotion to anything, how… how do you do well in that thing? …You know what I mean: It's, um, you got to believe in what you're doing basically… – PrEng01

I often emphasize emotional intelligence is far… superior than … and I stress that even in the work environment now currently… You don't need to have, like, a list of degrees behind your name. You literally have to be… have common sense and emotional intelligence. But, um, the thing about it is, is that you know it's about unwiring and rewiring… And as business owners and as women in this sector that's predominantly male-dominated, we need to also look at ourselves introspectively and… analyse. I mean, are we making the right… are we saying the right things? Are we emotionally intact? And now… do we… that our emotions get in the way of some of our decisions? All of those things. – PrEng07

So [the] only constant thing in life is change… So you got to go with the flow and adapt yourself. Sometimes it takes some of us a little bit longer than others… But you got to be open to it. – PrEng08

Let them do whatever they need to do. As long as they don't cross my personal boundaries. – PrEng10

So the first is, I think, um, my negotiating skills and, um, I think that you have to learn how to be diplomatic, um, in any work environment, but specifically in a contagious one… With HR and with your superiors and said… and speak to them logically, without emotion… Um, it was a very emotional situation, but I had to made myself be logical about it… Um, I, um, and you know there were lots of incidents, but a lot of it, you know, if you want the tools you would have to use basically your communicating skills and being logical about it as opposed to react/think emotionally. – PrEng11

Where you see somebody going on the path about you know, ag, the typical things about… especially with women… a lot of women who's not intellectually, um, or emotionally strong… Who don't have that emotional intelligence… You'll see the back and forth e-mails, um, and a lot of the, um, for lack of better words… A lot of the bitching and the moaning going in the e-mails… To be able to prove a point. Um, and then at certain points you need to under… you know you need to be the bigger person… And if that person feels that they need to have the last say… Let the person have the last say and move on. – PrEng20

4.3.3.2 Theme 2 – Passion for the Career, Opportunities Afforded and Financial Empowerment.

Passion for the career, opportunities afforded and financial empowerment were dominant in the storytelling. The last question posed to participants in the interview session for this study was about what motivated them to remain in their profession as engineers. Responses ranged widely, with many stating it was their passion for the work they were involved in, even if cavities were still prevalent in the industry, as indicated by PrEng01. Others spoke about the opportunities this industry had made possible for them and how this had added to their growth and development in the space. There were opportunities to work with international organisations, to travel, to be a part of cutting edge developments in the engineering space. Some alluded to breaking the norm, in terms of what perceptions drove; in terms of what women could and could not do. Therefore, it was their way of proving themselves worthy opponents to their male counterparts. They saw this as a major challenge for women in the engineering space and saw their decision to remain in the field as setting an example to incoming females.

> *You sort of just wanna proof to yourself, for me I… I want to proof to myself that I can be an engineer and that I can make a difference.* – PrEng02

> *People telling me I can't do something. That's really it. It's my biggest… it's my biggest thing, and it's my biggest problem… I'll do it.* – PrEng03

> *Um, the only way I can make it better for anybody else coming up is to show them that we were no different from our counterparts.* – PrEng08

> *I think I was trying to prove myself to the world.* – PrEng16

A few participants were candid about financial dependence keeping them in the engineering field. To exit would mean compromising their quality of life and they wanted their financial independence. What was evident, though, was that the work this profession entailed was interesting and challenged them on many levels, which they found appealing and desirable. However, it was more the people engagement, coupled tightly and highly informed by male-centric culture, that they found displeasing and a significant de-motivator. The times that a participant felt the urge to exit were mainly caused by experiences with people who were gender-and racially-driven. PrEng03 sometimes felt like quitting, '*but it's not because of the work… It's because of the drama*'. Below are some extracts from participants' accounts of what motivated them to remain.

> *I truly support, um, women in engineering throughout reach programmes… By trainings… by… by leading basically… And, um, yeah being an advocate for educating people… That's what motivates me, is sharing.* – PrEng01

> *People telling me I can't do something. That's really it. It's my biggest… it's my biggest thing and it's my biggest problem… I'll do it.* – PrEng03

> *But it also opened a lot more doors for me… And also now being in, um, private sector, um, in a global company, which we now {are] apparently the Number One company in the world to work for… It does actually make a huge difference because you treat you differently and it's a very flat structure… And the amount of opportunity that there is… Is something. So when you work hard you actually get rewarded for it.* – PrEng05

> *I'm not ambitious. I just get bored… And I get bored easily. Part of why my Master's works really well for me and the projects that I work on work really well for me, is 'cause it's not one stream of engineering. It is multi-faceted… It's multi-disciplinary and it's complex enough for… for it to hold my interest.* – PrEng06

I enjoy what I do. I'm passionate about what I do. It's not a job. And I think that's the most critical thing and irrespective of whether you're in a male-dominated area, whatever… I think it's important that you find your passion. You need to really… I mean I honestly don't come to work. I come to play because it's… it's exciting. – PrEng07

But what gets me up and to work and positive, is the fact that I need the salary. Um, if I had a choice, if my husband earned enough, I'd be more than happy to stay at home. [Laughter]. You know, cause there's so many things I'd like to do, like you know, crafting and whatever. But, um, I want to have a comfortable life. I don't wanna have to ask someone for money. Um, I like doing things for my family, doing things… For myself. Yes. Um, and not having to answer to anyone for it. – PrEng09

Well, I'm passionate about… I'm passionate about what I do. I really enjoy engineering… Um, I enjoy my line of work. I… something has to challenge me to enjoy it. – PrEng22

4.3.3.3 Conclusion.

Findings presented here relate to Research Question Three of this study, offered in this section as Statement Three – the decision to remain within the engineering field. Two main themes were presented, namely, survival mechanisms and passion for the career, opportunities afforded and financial empowerment. The participants' storytelling told of their different reasons for remaining motivated to stay in their profession as engineers, and the mechanisms they used to navigate this challenging playing field. Networking and group support, coupled with emotional intelligence and resilience, were the tools they applied and encouraged future female engineers to implement when they entered the engineering space. Their accounts of why they remained in the field were informative. However, the accounts raise some concerns, especially where these women still feel the need to prove themselves to feel a sense of belonging in what they still experience as a male-dominated space. On a deeper level, this presents as a systemic challenge that organisations need to revisit to reinforce a culture of gender-neutrality.

CHAPTER 5: DISCUSSION

5.1 Introduction

This section commences by reiterating the problem statement and the purpose of the study. Thereafter, the findings of the study are interpreted in relation to the research questions and then discussed in the broader context of the main sources of literature that informed the conceptual framework of this thesis. The approach adopted for this discussion involves first providing a summary of findings in relation to each research question, then offering similar analysis/interpretation of findings as related to research questions, before discussing this interpretation in the context of the literature reviewed earlier. The last step will effectively create a dialogue between the researcher, major thinkers in the field, and participants in this study. This will demonstrate the originality of the study with its rich data and indicate how this adds knowledge to the area of biculturalism and career orientation of women in a male-dominated profession.

5.2 Problem and Purpose of this Study

Literature is widely available that speaks to why women engineers leave their profession as well as why it is important to orientate young girls to opt for STEM-related degrees. However, the literature reviewed for this study pointed to a lack of research on the experiences of a specific grouping of women in the engineering space – South African-born women of Indian descent. Employment statistics presented earlier in the body of this thesis showed a very small representation of these women in the engineering space. Given current patriarchal cultural norms and value systems, this under-representation emphasises the importance of a question the literature

could not answer: What motivates a South African Indian woman engineer within a bicultural context to remain in her profession as an engineer, in an industry that remains male-dominated? To find the necessary answer, three research questions are offered, namely:

Research Question 1

To what extent does identity inform a bicultural context for South African Indian women engineers?

Research Question 2

Does a bicultural context inform South African Indian women engineers' social cognitive processing (self-efficacy and outcome expectations)?

Research Question 3

To what extent does social cognitive processing inform South African Indian women engineers' decision to remain in their profession?

5.3 Synthesis

In the section below, findings will be interpreted and presented based on themes identified relating to research question (now offered as research statements). This synthesis will involve a discussion involving the academic sources consulted earlier, the researcher, and participants in the current research – all speaking to the main focus areas of this study.

5.3.1 Research Question 1 – Identity and the bicultural context of South African Indian women engineers.

5.3.1.1 Summary of Findings.

Findings presented in relation to Research Question One—offered in this section as Statement One—spoke to the identity and bicultural context of South African Indian women engineers. A connection became apparent relating to the applicability of Indian cultural norms and values, that is, cultural looseness, tightness and subtle tightness, and how such this informed the negotiation and navigation of a bicultural identity for a South African Indian woman engineer.

Stories told by participants labelled gender as the identity tag taking precedence over race, thus informing societal perceptions that inevitably feed into the way women in engineering have been perceived. Their gender tag drove the social narrative of what society created and normalised as socially and culturally acceptable gendered roles. Historically, men have dominated engineering, and this remains the status quo. Hence, engineering is, for most, still perceived as a male occupation. This gendered mind-set places South African Indian women engineers under scrutiny in terms of what is acceptable and not acceptable culturally in the profession. Participants' narratives pointed to the prevalence of a macho culture that is exuded on site, as opposed to the office situation. The presence of an "old White boys club" was seen by most participants as enhancing male dominance, more especially, White male dominance – an issue that is yet to be addressed.

Research Question One investigated how identity informed the bicultural context of South African Indian women engineers. Three main themes emerged from the findings related to this question,

namely, negotiating and navigating a bicultural identity, societal perceptions about women, and women engineers in a male-dominated space.

5.3.1.2 Negotiating and navigating a bicultural identity.

According to Korte (2007): "Psychology defines identity as a cognitive construct of self- fundamentally relational and self-referential that answers the question 'Who am I?' " (pp. 168-169). Various scholars have contributed to the understanding of this concept of self, and central to all discussions has been the importance of the individual as the navigator of his/her trajectory (Alvesson et al., 2008). Choice is not always an option for ethnic women, nor is fluid navigation of trajectory, as lines are blurred with regard to their salient identity, with identities being governed by silent, invisible systems of oppression (Acker, 1989; Crenshaw, 1991; Booysen and Nkomo, 2010; Carrim and Nkomo, 2016). Gordon (2018) refers to the racially dominant assuming a self-justified reality, with the less-dominant lacking justification and their access to "being" seen as illegitimate (Crenshaw, 1991; Benet-Martinez, 2002; Benet-Martínez, Lee and Leu, 2006).

For minority women, identity presents its own set of challenges, given that relational and self-referential processes to harness the notion of self are pre-determined by culturally driven perceptions that stereotype women. Both ethnic minority and ethnic majority women are generally governed by a tight collectivistic cultural system that informs norms and values: it is patriarchal in nature and perpetuates the oppression women experience at a much deeper level (Barnes, 2017). The dimensions of cultural variation and its connection to aspects of the self are significant when it comes to understanding why people behave or navigate differently when in specific cultural contexts (Triandis, 1989). Cultural tightness-looseness and individualism-collectivism depend on

which context the self finds itself in, and determine the individual's response and experience (Triandis, 1989). This culturally induced gender stereotyping is often presented in a derogatory or negative manner to enhance the dominance of one group (men) over another (women) (Tajfel, 1979; Acker, 1989).

Bicultural, or people who are part of two cultures, form a growing population that has been studied in recent years, yet much remains to be learnt about exactly how their unique experiences of negotiating their cultures affect the way they think and behave (Benet-Martinez, 2002; West et al., 2017). To understand life experiences requires a deeper understanding of identities (social tags) in relation to space, continuity and interaction, all of which inform an experience (Clandinin and Connelly, 2006). Ethnic-minority identity cannot be understood as a simple stand-alone, rather, as interlinked fluid versions of self that are formed and function within systems/structures of oppression (Acker, 1989; Hooks, 1989; Bell, 1990; Crenshaw, 1991).

History, through its oppressive eras, informed a world where individuals who have multiple minority statuses often experience mistreatment stemming from multiple, interconnected systems of inequality (Harnois, 2015a). The arrival of indentured Indians in South Africa is an important point of departure because even under oppressive colonialism, the perceived role of an Indian woman remained unchanged for the Indian male. This was mainly due to the religious doctrines that informed cultural ideology, which dictated the family dynamics of the Indian home as being androcentric (Meer, 1972; Khan, 2012; Jaga et al., 2018). Colonialism heightened these preconceived notions defining Indian women through rules and laws such as those governing an Indian woman's entrance into the workspace during the colonial period, making this dependent on her husband's domiciliary status (Govinden, 2008).

These laws exacerbated a traditional system already at work in the homes of this minority. For some, this system prevails even now, in both home and workplace, ironically in the context of democracy. Hooks (1989) stated "[T]he struggle may not even begin with the coloniser, it may begin within one's segregated colonized community and family" (p. 20). An oppression that begins in the home and traverses other facets of the individual's life is what presents in these scenarios. Even though only two of the 25 participants presented with this challenge—a figure which may call insignificant—the mere fact that it prevails even in the smallest percentage is evidence that the "invisible identity shackles" driven by perceptions and imposed on a woman because of her otherness have been merely decreased, not completely eradicated (Meer, 1972; Jaga et al., 2018). In the words of Hooks (1989): "To be in the margin is to be part of the whole but outside the main body" (p. 20). Hooks (1989) refer through this statement to the identity of women of colour, whose existence and relevance are driven by birth alone. Their intersectional identities—that is, gender, race and ethnicity—are governed by a socialisation (upbringing) where relevance of this existence is relegated to a space of marginality (Hooks, 1989, Du Bois, 1969; Crenshaw, 1991; Levant, Wong and Klann, 2017).

A small number of cases in this study presented their personal space/context as a breeding ground giving rise to this space of marginality. Participants projected cultural tightness through these accounts (Triandis, 1989).

> *In a Muslim school there's very much like… the expectation was really the children be a wife and a mother. There wasn't any real future after that. My family were very opposed to it because they said: 'You know that's not something that girls do and you know it's a male industry'.* – PrEng04

Also a relationship suffered for that reason because Indian men don't understand why you feel like you need to be in a position of… in high position… we should be able to do… I mean it was… it just felt like I was still… I was still giving my power away… but to somebody else and I don't want to be with someone who still sees Indian woman to be… needing to be a subservient person because we are strong, powerful women and I find that most Indian women doubt their own worth. – PrEng11

My husband was not working… he's an Indian male, typical you know, I have to be in charge. I have to be you know… I don't know, um, this provider and all that kind of stuff… So once I started working, I started being independent, I was earning money and basically I was supporting us for the two years that we were married. So it was very difficult for him, um, especially being from an Indian background, you know. They… they feel like they be in charge of everything. – PrEng13

These narratives highlight the penetrative power of culturally embedded meanings of gender that act to disable women's agency and disrupt fluid navigation in the bicultural space.

Deep and wide-ranging investigation has established that the interlocking nature of processes of differentiation/social association (*racialisation, ethnicisation, gendering*) within systems of domination (*colonialism, sexism, patriarchy, racism, apartheid*) isolates the experiences of some women as uniquely different to others, leading to the identity of *"otherness"* (Hooks, 1989; Acker, 2006; Carrim, 2016). This is evident from the narratives presented by participants whose experiences differ from the two cases presented above.

Um, but they didn't force us to, um, to fit into that mould that society expected but they did, um, they did guide us towards it at times. – PrEng12

My dad supported me. Um, and I actually feel like sometimes all the people in the family were resentful of the fact that I was getting away with stuff and like, 'nobody forced me to cook'. My gran… my mom's… my dad's mom lived with us. I didn't have to cook. I didn't have to do anything, I would come home from university, and food is there. – PrEng09

The experiences of PrEng04, PrEng09 and PrEng12 differ in terms of their socialisation highlighting *otherness,* even within a racial grouping from which one might expect homogenous narratives (Hooks, 1989). The experiences of PrEng04 include her interaction with members in her personal context from a place of marginality where gender roles were culturally or religiously dictated. She was required to conform to the role a Muslim woman was expected to play, in a patrifocal home (a home focused or centred on the father). PrEng12, on the other hand, is "on a fence" where she is not directly told what her gendered role entails, but this is subtly insinuated. PrEng09 shares an experience where there was no pressure to assume culturally driven gendered roles, but any non-adherence on her part led to her being stigmatised as non-conformist by old-school mind-set relatives and members of the Indian community.

Although this otherness that each woman carries makes her unique through her experiences that differ from other women, there is still a shared commonality. This is expressed in the way a woman's identity, based on her anatomical make-up, is fashioned by society as "soft and weak", while a man's identity is presented as "toughness and strength". These perceptions informed an oppressive "altruism" that placed men as women's caregivers and gatekeepers (Qureshi, 2014).

> *There were times when, um, when I need to travel… and being a female Muslim… Um, I'm supposed to travel with somebody. With him… with my husband, brother, father, someone. I… I had to… I had to give up a couple of trips because there was nobody to go with me*. – PrEng12

> *Our male counterparts, whether it's your dad, your husband… they all very much, 'Oh well, you should be at home and you should be like cooking, looking after kids'*. – PrEng04

These perceptions continue to place women in a position where the fight for relevance and meaningful inclusion, and exiting the space of marginality, ensues. For PrEng16 it meant: *'I mean*

firstly you… you're already, um, a bit of bad girl because you're choosing to go study like the man. You know like you a lost cause already'. These perceptions reinforce the gap that disrupts meaningful inclusivity of women in the workplace (Acker, 1990).

For most participants, navigating identities in the organisational space was a stressful process. The anxiety that comes with navigating between two different contexts (based on the emotional and physical disturbances stemming from a person's bicultural existence) presents as bicultural stress for these participants (Bell, 1990; Orlando and Graimes, 1996). Challenges are presented, especially for those women whose historic background involves systems of oppression and subjugation (King Miller, 2017). They must now seamlessly navigate a professional space that is male-dominated and still very much filled with gendered perceptions about women in the field (Hewlett, 2008). These layers of discrimination come not only from males of a dominant race, but from a woman's own race, as well as from some who do not share her racial grouping (De la Rey, 1997).

> *I'd had people assuming that I am the secretary. Um, but you know when obviously it did really happen to so many people that it's… it's almost like a joke amongst us now… But you often get… get asked to make the tea or the coffee.* – PrEng12

A few of the participants had been the first females on their teams. This presented them with a trial-and-error process in the absence of senior female engineers as role models who could help them ease into this environment.

> *I did mention to you that I'm the first South African Indian… second Black female in the country. The first one didn't actually, um, practice in engineering… And, um, the, um, first... first female engineer in the country to have started… started a consulting practice irrespective of colour.* – PrEng07

I was first, the only engineer at the start. Only female engineer… I mean a… a friend of mine, she was on site and she was the only female, um, like engineer on site So, um, I… we did have some labourers and there, but the thing is, it's you also need to like, um, create this, um, kind of, um, boundaries so that it's not like to… you don't become too comfortable there. Well, that was the issue she would be having on site. She couldn't really like, um, have anybody to talk to. She have like some of the guys but… But now there is a bit more, um, female engineers at the workplace.. So it's becoming a bit better in that sense in terms of the loneliness. – PrEng21

I was the only woman but it was… it was never… well it was intimidating but, um, never because, um, I was the woman. Like they… they looked after me. They were… it was a good team. Yes, as a woman I would say I felt comfortable. Um I'd say mostly because it was… well I'm assuming now but, um, I've never been on site… So being in a… in an office space, um, there was some sort of comfort. – PrEng02

Some participants stated that their experience in the engineering space was good with minimal to no negative experiences. However, the majority articulated experiences that saw them having to fight to exit the space of marginality in which they found themselves placed because of their gender and in some cases, racial identity (Hooks, 1989). Most often, armouring was required to safeguard them from the oppression predicated by their gender and race (Bell and Nkomo, 1998). "Antigens", as described in *The Athena Factor* (Hewlett, 2008), remain prevalent in 2019 and 2020, rendering the navigation of identities within the bicultural space a continuing challenge (Hewlett, 2008).

5.3.1.3 Societal perceptions about Indian women and women engineers.

In many societies, White males have been dominant in relation to White women, Black and other ethnic men and Black and other ethnic women (Acker, 2006). Women in STEM roles were expected to conform to the ideologies of the organisation. These ideologies were mostly male-orientated, resulting in a socio-cultural dilemma that ethnic women faced, as opposed to White

females (Canham, 2017; Canham and Maier, 2018; Barnes, 2017). The importance of dedicating time and effort to work, as demanded of these women, would have been labelled as deviant in their traditional roles. This placed them in a situation where they were caught between differing ideologies, placing their intersecting identities under duress to either conform or rebel.

Many participants alluded to their upbringing during the apartheid regime, more specifically how this spoke to multiple interlocking social identities, and diverse systems of power, privilege, oppression and inequity (Wong et al., 2017). The influence of politically oppressive systems on career options, in relation to racial affiliation, presented a scenario where these careers—even after the abolition of apartheid—informed how parents saw futures for their children.

> *I mean, it's definitely to do with the way they grew up and how they, um, experience life. Um, a lot of it, um, is because there was no opportunities… Um, and during apartheid it was less also. Um, you know my father actually got to study Masters in Chemistry, being one of the very few Indian males to have done that in his years. Um, so he was, you know, fortunate enough to be… further his studies… uncles and aunts mostly were teachers and, um, 'cause that's all Indian parents could do then.* – PrEng11

> *Indian woman should be doctors or lawyers, not an engineer, I think, because it was, um, it wasn't common, it was breaking the norms and generally Indian parents are very, um, you know, what's common is what is understood, you know Indian… the… the Indian parents of old school, if I can say that… play it very safe… So going out of the norm is not necessarily the safe way for them.* – PrEng20

> *When I started studying, but my grandma was like: 'Oh, you have good results. Why don't you be a doctor, why did you pick engineering?'* – PrEng15

Identities, informed by perceptions within the cultural and political context in which these women were raised, presented for them the basis on which gendered roles were defined (Meer, 1972; Ahmed and Carrim, 2016; Carrim, 2016).

A few of the scenarios presented in this study displayed how tight collectivistic cultural norms sought to disempower these women participants through patriarchal systems reinforcing subjugation and oppression. The conundrum facing these participants was described as stressful navigation. This stress was caused by an expectation by males in the personal context that the role of a Muslim woman would be adhered, to even in the professional context. Stories presented by PrEng04 and PrEng12 articulate the bicultural stress experienced when navigating their identities in this bicultural space and the challenges this presented when they sought to maintain balance in their personal contexts, together with the negative impact it had on growth and opportunities in their professional contexts.

Most of the narratives in this study told of support being received from some individuals in their personal space, with negative responses from others. The latter were mostly older women, i.e. their mothers or other womenfolk in their families or communities. Such behaviour probably resulted from the socialisation process these women might have undergone in their upbringing, giving rise to their perceptions of a woman's place in the family and role in society (Meer, 1972; Govinden, 2008). This socialisation process links to roles that involve marriage, marital duties to the husband, childbearing and child rearing. They are roles most have lived in their lives, and that fed into an acceptable norm. Fatima Meer stated: "[T]heir roles as mothers, wives, daughters and daughter-in-laws inform their relevance in their community" – this was in reference to an Indian woman's roles in the Indian household (Meer, 1972).

Studies speaking to the identity work that Indian women managers engaged in to control their bicultural identity, identified that women were still seen as minors, dependent on the men who were, and would be, in their life at some point, from father to brother, upon marriage to husband, and as a widow to their sons (Carrim, 2012). The story told by PrEng12 about events in 2020, as documented through this study, mirrors practices that were prevalent in 1972 and still prevail to date, indicative of the relentless caging effect that cultural norms and values still present for some Indian women.

Most participants stated that their childhoods could have been gender-limiting had they been raised in an overly orthodox, culture-strict Indian home family. However, their stories tell a different tale. They depict their homes as support zones, a motivating environment, where their existence was not diminished according to anatomical make-up or the cultural norms expected of women just because of gender. The homes in which the majority of these participants were raised applied a cultural looseness that triggered a sense of self for them, rendering their navigation a more fluid and less-cumbersome journey, as opposed to the only two participants who stated otherwise (Triandis, 1989).

> *There was a very strong support from my immediate family and my extended family and this goes across my family for all of my cousins, um, that they're very supportive of having education and women… women being educated*. – PrEng06

> *I think, though, my parents are a little different in that they were, I think, a little bit more liberal and not as strict when it came… To being, you know, like the very orthodox Indian families. I think my parents were little bit… little bit, um, against the green when it came to the way they raised us in that respect*. – PrEng18.

The relevant academic literature reviewed for this research spoke to cultural penetration that drove gendered roles, with deep undertones of male dominance and patriarchy rearing their heads, determined to prevail at all costs (Meer, 1972; Hooks, 1989; Schein et al., 1996; Ryan and Haslam, 2005; Booysen and Nkomo, 2010; Bullough et al., 2017; Akinlolu and Haupt, 2018). However, these narratives also provide evidence that something has changed in the way socialisation in the home is happening in relation to the identity of an Indian woman. Through the relaxation of archaic perceptions about the nature of woman, there comes potential for women to be meaningfully engaged.

5.3.1.4 Male dominance.

According to King Miller (2017): "Historically, women have faced systematic barriers with regard to their participation in science, technology, engineering, and mathematics" (p. 1). This she attributed to perceptions about the identities and roles of women stemming from past regimes of oppression, which created social meanings as a way of classifying people based on race, gender and class (Hooks, 1989; Acker, 2006; Carrim, 2016). Within the Science, Technology, Engineering and Maths (STEM) fields, engineering continues to show the highest attrition rate for females (Hewlett, 2008; Fouad, Chang, Wan and Singh, 2017). According to participants, identity in this space—more specifically their gender than their race identity tag—presented as a disabler. The coupling of inequality regimes and the socialisation processes happening within these regimes led to categorisation through the formulation of hierarchies and ranking, which emphasised not only gender, but race, giving rise to a "double jeopardy" endured by ethnic women (Barnes, 2017).

Gender-specific challenges articulated by participants projected a gloomy environment where these women were alienated, their voices stifled, their expertise questioned, and their femaleness often placing them in situations rife with sexual harassment and victimisation.

> *I found it very dominant Afrikaans male there as well, who, um, do use often use bullying as a tactic to get us to do things or to be afraid.* – PrEng11

> *I had the Chief Resident Engineer tell me that, um, 'Woman belong in the kitchen', directly to my face, hit me on the ass a few times, because he felt like that he could*. – PrEng11

Participants saw these challenges arise because of culturally born perceptions about gender and the percolation of these into a male-dominated profession. This made navigation between the two attributional orientations a difficult experience (Benet, Lee and Morris, 2002). In the words of Alvesson et al. (2008): "Individuals craft a self-narrative by drawing on cultural resources as well as memories and desires to reproduce or transform their self or self".

Identity work on the part of these women was expressed in most narratives: it involved splitting the self, so that between the indifferent engineer at work and the individual outside work, the "real me" emerges (Collinson, 2003). This cultural frame-switching is engaged as a situational response to the male-dominated work context the participant must successfully traverse (Meca, Eichas, Schwartz and Davis, 2019). Preconceived notions about the profession, coupled with the status quo in terms of the space still being dominated by men, further intensify this "belief" in engineering as a male profession and one that is unsuitable, or an oddity, for a woman. The ideal worker in this space is perceived to be male, thereby marginalising women (Acker, 1990).

Gender was more pronounced than racial classification, presenting the former as the dominant disabler disrupting seamless navigation in the bicultural space. Some participants stated that this gendered approach to the profession also presented many cavities within engineering organisations, in terms of their expected throughput. According to Acker (1990): "Abstract jobs and hierarchies, common concepts in organizational thinking, assume a disembodied and universal worker" (p. 139).

This worker cited above is actually a man: men's bodies, sexuality and relationships to procreation and paid work are subsumed in the image of the worker. According to Acker (1990): "Images of men's bodies and masculinity pervade organizational processes, marginalizing women and contributing to the maintenance of gender segregation in organisations" (p. 139). Acker (1990) stated further that gendered processes mean: "[A]dvantages and disadvantages, exploitation and control, actions and emotions, meaning and identity are patterned through, and in terms of, distinctions between male and female, masculine and feminine" (p. 146).

For participants, the gendered process presented a comparison that was evident in terms of how a woman's throughput was perceived in relation to that of her male counterpart. Male dominance in the field created a one-size-fits-all approach to the way benchmarking and performance were viewed. Even though the social dynamics of a male and female differ, participants found themselves having to work harder to match a male-driven benchmark in order to prove themselves worthy of acceptance into the engineering community (Fouad et al., 2017).

> *There's… there's always that… how can I say… the questioning your ability… to some degree on your side the insecurity and then at the same time in an environment where you… where you, yeah, want the many… you having to prove yourself on a continuous basis.* – PrEng25

Sometimes people look past you… as in you know if you're in a meeting or so, um, you have to sort of prove yourself… more than, um, a male engineer would need to do. – PrEng22

It's sad to be on this side whereby you must prove yourself to be given opportunities whereby males are given opportunities through themselves. – PrEng14

This hasn't happened personally to myself, but, um, I was in the industry where, um, senior mentors would talk down to their female counterparts but engage with the male on… on a level that you would expect… I don't know if that could have been any amount of circumstances that could awarded that, but, um, for me I, um, I had to work towards fighting that off. – PrEng01

Two participants alluded to using the "right messenger"—in each case an "old White male"—to ensure their expertise was taken seriously by a client who would not engage with them because they were female. This goes back to the undertones of gendered perceptions placing these participants in a space of marginality, where one has to resort to such extreme measures to exist (Hooks, 1989). A woman's relevance is clearly questionable if she has to resort to these antics. The client's behaviour provided an indication of what had been historically trusted as being the norm (White male engineers), as against what was new in the environment (an Indian woman engineer). In the case of these participants, they may be engineers by profession, but they find themselves unable to fully own that title. Gender bias solidified a narrative of gender suffocation infiltrating the working environment.

In addition, these participants have to sport intersecting identities while balancing the high expectations of a demanding profession, which often results in an imbalance where one space is compromised at the expense of the other (Crenshaw, 1989, 1991; Bell, 1990, Jaga et al., 2018). Choosing between professional and personal responsibilities becomes a challenge in a space where

the mere act of choosing the latter will inevitably lead to stunted growth and opportunities for mobility, while choosing the former leads to disruption on the home front (Ahmed and Carrim, 2016; Jaga et al., 2018). Kur and Bunning (1996) state that choices between organisational worthy goals, and personal worthy goals are critical decision-making moments. These decisions are crucial to mobility within an organisation where women can achieve senior positions by carefully navigating through issues related to motherhood, racism, sexism and discrimination on the basis of identity (Kur and Bunning, 1996; Sanchez-Hucles and Davis, 2010).

Participants related their stresses when motherhood became an added identity, and where situations forced them to turn down opportunities, or sacrifice their responsibility to their child/children to take the career opportunity – only to be judged by the community and labelled "bad mothers". According to Pillay (2018), organisational policies generally make allowance for a woman to dismantle her career to care for a child, while a father is not allowed more than a few days to be part of an infant's life. Such decisions become much harder for these women when they affect not only themselves but also those around them.

Women must make choices that will be crucial to their mobility within an organisation. It is evident from the experiences articulated by these women in 2019 and 2020 that making decisions focused on career climb has the potential to positively, as well as negatively, affect women in engineering, as opposed to their male counterparts, given women's intersecting identities that they must navigate in a bicultural space. So, how does identity inform the bicultural context of South African Indian women engineers?

Women are faced with the dilemma of conforming to a female stereotype that makes them "not good respondents" on the one hand, or on the other, adopt a leader stereotype and not be considered "proper" women (Ryan and Haslam, 2011). For decades, women all over the world have been questioning and confronting their conventional identities and striving to establish more equal and self-determined ways of reinforcing their gender, free of bias and stereotyping tendencies (Jenkins, 2014).

In this study, evidence showed that the identity tags these women sport either enabled or disabled navigation in their bicultural context. This bicultural context revealed experiences informed by gendered perceptions in varying ways in the two different spaces. The connection that was evidenced relates to comparison of supportive and unsupportive families. Supportive families present as enablers for these participants, while unsupportive families generate disabling effects. These family actions affect identity as a social construct, by creating gender-specific expectations that unfold as limitations, hindering fluid navigation of a woman's identities in a bicultural space. Participants' experiences pointed to an association between the varied application of Indian cultural norms and values, that is, cultural looseness, tightness and subtle tightness. The application of these cultural norms and values informed socialisation and informed navigation as either fluid or disruptive for participants' identities in both their personal and professional spaces.

5.3.2 Research Question 2 – Bicultural context and South African Indian women engineers' social cognitive processing.

5.3.2.1 Summary of Findings.

Findings spoke to the bicultural context and South African Indian women engineers' social cognitive processing. Two main themes presented, namely, support and encouragement in a woman's personal space to build self-efficacy and support, and mentorship in her professional space to maintain self-efficacy. Questions posed in this part of the interview schedule sought to understand a South African Indian woman's application of social cognitive processing in a bicultural space and her levels of self-efficacy.

What was evident was the power that support structures within a bicultural space had to positively or negatively influence social cognitive processing. This in turn built or broke levels of self-belief/self-efficacy. Twenty-four of the 25 stories told of a supportive family support structure and the impact this had on their levels of confidence and belief in self. This support was a build-up that inevitably drove their career trajectory. Maintaining those levels proved for many a challenge because of the negative experiences around their identity tags of gender and race in the workspace.

These experiences activated social cognitive processing that resulted in a flight-or-fight response. The latter response was the least-chosen option, given the way these women saw their organisations remaining silent in gendered or racially driven work scenarios. Very few participants reported satisfaction in the professional space. It was apparent through their storytelling that identity tags of race and gender continue to disadvantage them as women in their professional space. Instead, the support they receive from their personal space is what sustains positive cognitive processing and prevents the attrition of these women's levels of self-efficacy.

Research Question Two investigated how living in a bicultural context informs a South African Indian woman engineer's social cognitive processing, that is, how experiences within her differing contexts informed her social cognition and related action behaviour. Two main themes emerged from the findings related to this question, namely, support and encouragement in her personal space to build self-efficacy, and support and mentorship in her professional space to maintain self-efficacy.

5.3.2.2 Support and encouragement in a woman's personal space to build self-efficacy.

Dominant in the stories shared by the participants was the power that support structures, as information sources, wielded within a bicultural space, and how this positively or negatively prompted social cognitive processing that either built or broke levels of self-belief/self-efficacy, thereby impacting action behaviour. SCCT theorised that self-efficacy expectations are formulated through four information sources (learning experiences), namely: *personal performance accomplishment* (successful performance of a given behaviour); *vicarious learning* (observation of others performing a behaviour); *social persuasion* (verbal encouragement from others); and *physiological and affective states* (methods of decreasing an individual's emotional state) (Lent, 2000; Lent et al., 2006; Lent et al., 2008).

The majority of participants reported support being received from family through strong maternal motivation, from spouses and, interestingly, from the father figure. Many participants as the motivator, supporting a woman's choices and giving importance and relevance to her voice presented the father figure: this was an unexpected finding that contradicts what academic

literature has historically said about the patriarchal Indian home, in terms of the role of the father (Carrim, 2016; Jaga et al., 2018). For example, Meer (1972) wrote with reference to an Indian woman's roles in the Indian household "their roles as mothers, wives, daughters and daughter-in-laws inform their relevance in their community". Women were still seen as minors, dependent on the men who were and would be in their lives at some point – from father, to brother, upon marriage to husband, and as a widow to her son (Carrim, 2012).

> *"It was my dad. Um he… He… he did career guidance counselling and he were taken a… a group of kids to a career day… and he saw there's girls pondering over circuit boards and things and he said he just pictured me doing it. Um, I was encouraged to do it, especially by my dad, who wanted me to be independent, you know. Took me out. Showed me how to change a tyre. Made me do things with him. We fix things together.* – PrEng08

> *My dad was a 100 percent. He says 'Understand these are the… the holdbacks or these are the negatives, these are the positives. You're happy with it, you go ahead'.* – PrEng10

> *I'd say my dad… my… my father, you know, had… well just the two of us, there was no sons, and I'm the oldest… So I was like his shadow and he's a mechanical engineer by profession, so… Always think out loud, and was you know experimenting in the garage, had a lot of tools and things… Quite a handy guy. So I was behind him all the time watching. Subsequently developed a… a… a MacGyver touch… Similar to him. So yeah, I'd say the profession helped me quite heavily on… on that aspect'.* – PrEng18

Findings from a 2016 study on the dual careers of ethnic minority couples relate to the findings in this study showing spousal support was received by a majority of participants (Ahmed and Carrim, 2016). Of the 25 participants, only two described being burdened with unsupportive spouses whose actions led to marital discord. Some five participants were married to engineers, and advised that sharing a profession also helped, as their spouses understood the rules of the game and what one was presented with on the playing field.

PrEng16 stated that she was grateful to have a "reasonably" supportive husband but found herself having to negotiate with him to take on parental duties. This was something that did not feel right. PrEng16 stated:

> *I'm… I'm thankful my husband is reasonably supportive. So when I spoke to him about this he says: 'Well, let's see what we can do'. Either he's going to have to take off work and fetch them or… But it's… but it's, you know it's that thing of the actual thing where you actually needs to negotiate that you know. It's not a thing… Of where you… you do have free will to just say… 'You know I'm deciding I'm doing this and that's it.' You know there's still…*

PrEng15 alluded to Indian female engineers marrying White males so that they would have more flexibility within their profession. PrEng15 stated:

> *So you'll find that lots of female[s], I know lots of Indian female engineers who are married [to] White people. If you… and for lots of people who are in a very traditional marriage, you'll find that it's very difficult to be, um, to kind of be who you are because… If in a very traditional marriage, your role is very different. And so it also you now also at competition and at the end it depends on the kind of marriage that you have…*

These findings were indicative of two things, namely, that mind-sets are shifting in homes that were once driven by male-favouring norms and value systems, and that this change offers mass potential for unshackling women from the chains of coerced gendered roles and mitigating their stifled agency (Ahmed and Carrim, 2016; Carrim and Nkomo, 2016). Such an environment creates for women the ability to effortlessly navigate bicultural identities within their personal space/ context. Twenty-four of the 25 stories told of supportive family support structures *(social persuasion-verbal encouragement from others)*. What was noteworthy about the support that these women described was the way it infiltrated and influenced the way these women saw themselves,

how this enriched a strong mindset and encouraged high levels of confidence and self-belief (*physiological and affective states*).

Participants clearly thrived on this type of support and their stories evidenced a triggered positive social cognition and action behaviour. The support that these women spoke about was premised on the loosening, or flexible application, of Indian cultural norms. The academic literature showed that most Indian women have historically been raised in homes practicing traditional patriarchal ideologies (Meer, 1972; Batliwala and Dhanraj, 2004). Speaking their minds or following their ambitions was seen as a contravention of the "rules" governing their traditional patriarchal norms and values. Indian women had one purpose in the many identities they sported: the role of silence, subordination and marginalisation (Carrim, 2012; Govinden, 2008).

The support that participants described in their stories is indicative of the slow death of previous archaic cultural systems of gender oppression, together with a slow change in Indian homes, where the perceived role of Indian women is changing.

> *I grew up in a very democratic and diplomatic family who were very supportive of any ideas that I have… I may have put forward to them.* – PrEng01

> *My parents empowered me from a young age… to stand up for what I believe in and always ask, and there's no such thing as a stupid question and don't just say, 'Yes'. Don't be like a subordinate.* – PrEng03

> *So I feel like, um, I can… my story would probably relate a lot more to, um, to Indian women growing… young women growing up in their families now because you have the freedom of choice to be able… to be able to do pretty much whatever you want, um, and you'll make those choices and they're not, um, they're not, um, imposed on you by your father…* – PrEng15

Research indicated that highly educated women tend to have a strong awareness of gendered inequality (Harnois, 2015a). Narratives that speak to the participants' personal context are perhaps the reason why they can so easily discern the lack of such in their professional space. The extracts presented here indicate the support these highly educated women receive from their personal context that negates gender bias or suffocation. Their responses to such support became an impetus for positive social cognition (positive thoughts) that fed into positive action behaviour.

5.3.2.3 Support and mentorship in a woman's professional space to maintain self-efficacy.

The professional context presented challenges for most participants. These were challenges spurred by gender and to some extent, racial identity tags. Participants' stories depicted an environment where White male dominance drove a macho culture that presented a "chilly environment" for these women (Hewlett, 2008). Acceptance as an engineer was something women had to earn, most often by having to work twice as hard as a man or sacrificing the balance in their personal context to meet the deliverables of their professional context, just to feel part of the community. Women are faced with the dilemma of either conforming to a female stereotype, which makes them "not good respondents", or adopting a leader stereotype and not being considered "proper" women (Ryan and Haslam, 2011).

Irrespective of the fact that participants had obtained an engineering qualification through a Higher Education Institution, just as their male counterparts had done, otherness rendered women the outsider, in what can be described as the "old White boys club" (Hewlett, 2008).

It was very overwhelming. I felt like I knew nothing. It was very White male-dominated. – PrEng04

> *Where it is in certain departments, where it was very White–dominated… which came in with, um, you know, particular, um, for example me being an engineer, um, working with a maintenance manager for example... um a White, um, older maintenance manager... so I would find an issue, um, report it and provide my recommendation... then the manager would refute [refer] to the recommendation based on his experience. But it becomes a thing more around, um, you know the perception that I received is: 'You're not taking me seriously because I'm younger and I'm a woman'.* – PrEng20

> *In this profession… and it is very, very male-dominated, more especially White male-dominated. And it's something that still needs to change.* – PrEng11

Research on women and men in the workplace pointed to the reluctance of staff to accept a female supervisor and male managers not being convinced a female leader was effective (Ryan and Haslam, 2005). This is perhaps the greatest hurdle that women have to face in terms of gender stereotyping, more so as such bias is frequently unconscious bias, making it difficult to address (Bullough et al., 2017, p. 212). PrEng11 earlier related a near-physical assault by her White male Afrikaner manager, as well as sexual harassment. The same manager was also guilty of gender stereotyping, as PrEng11 states:

> *When we got interns there, they were actually lower in job than me because you get interns, but we were permanently… no not permanently, but contractually employed. And he actually told them directly that 'women belong in the kitchen'. And it's not the first time I… I would have heard that in my career.* – PrEng11

The Athena Factor (Hewlett, 2008) describes the global experiences of women in STEM careers and women/girls who opt for STEM degrees, while exploring the career trajectories of women in SET in 43 global corporate settings in the United Kingdom and the United States. Findings from this report indicated that women in SET exuded a passion for their careers, while noting the presence of (a) hostile macho cultures, (b) isolation, (c) mysterious career paths, (d) systems of

risk and reward, and (e) extreme work pressures (Hewlett, 2008). These "antigens", as they were labelled by the report, saw women finding themselves in precarious situations that led to a fight-or-flight response, i.e. whether to remain career-orientated or exit the profession (Hewlett, 2008).

The antigens expressed in *The Athena Factor* (Hewlett, 2008) dominated stories shared by participants in this study during 2019 to 2020. Male dominance, specifically White male dominance for these participants, presented as a blockage for upward growth, given that old gender bias dialogues from then to now still prevailed.

> *Sit in meetings on a more senior level, you'd actually find that majority of them at the time was all White male*. – PrEng22

> *Actually when I first, um, started going for interviews, I went for a job interview once and, um, due to the fact that I was a young Indian woman at the time, I didn't get the job due to the site having elderly male workers that… would be working under me… and I later found that that, um, male from the same class as I got the job*. – PrEng14

Salary disparity in terms of what female engineers get paid in comparison to their male counterparts is still prevalent.

> *I ended up working in a destructive department there at ------, there was a White male who had joined with less experience than me but who was earning more.* – PrEng23

> *At the same time in the engineering stuff you're in the… engineering fraternity it's wild with White, it's male and it's slow-moving.* – PrEng06

These experiences activated social cognitive processing resulting in a flight-or-fight response leading to "physiological and affective states negatively induced" (Lent et al., 2008; Lent, 2013). Very few participants indicated satisfaction with the professional space: this is alarming given that the national agenda in relation to gender equality in the workspace is to create an equal and fair

playing field. The stories told then beg an important question: Is the inclusion of women by their organisations merely a form of tokenism to tick the gender-inclusive box so that they appear to be in the eyes of onlookers, gender-compliant?

Some participants related their mentorship experiences as the "vicarious learning/observation of others performing a behaviour", which they advised at least gave them credibility and influenced the way they were seen in their profession by other male counterparts (Lent et al., 2008; Lent, 2013). This is a concerning development, given that male mentorship (depending on the willingness of the mentor) is portrayed as a tool to drive female relevance and acceptance in the engineering community. Yet stand-alone identity of gender denies this acceptance.

> *You know, when he came on board I almost felt like he gave me credibility… because then people would actually say: 'Oh -----, you know like you got a White male and maybe you're doing on something*. – PrEng04

These acute responses indicate contingencies to which women must resort in order to drive their cognitive processing in a positive trajectory. For them, it has passed the point of where they are willing to let the biases that they know exist, block them from doing what they need.

> *What I've done is I've stepped back and I send them the right type of messenger… To make the same statement. Because at the end of the day my job as a professional, under my company's name, is to make sure that the company provides the right advice that the client must listen to… and if she doesn't want to listen to it from me, that's fine. I'll just pick the right person who would say exactly what I want them to say, but she'll hear it from them. ----- is [a] White racist town, quite simply, to put it bluntly. It is White. It's racist. It's never going to change. So that is now an issue. So in order for me to still get my job done, I basically hired my boss. So my boss retired… and I said to him: 'Come join my project', and he said: 'Cool', and then he's White, he's male… They're gonna listen to you cause you're White and you have grey hair.* – PrEng06

In whatever form presented, it is significant to note that ideologies of the organisation, mostly male-orientated, prevail when such practices are evident (Canham and Maier, 2018; Barnes, 2017). If women have to resort to dodges such as that described above by PrEng06, to ensure they not only exist but, more importantly, become relevant in their profession, their oppression becomes almost an accepted fate. This means they must either assimilate, categorise or alternate their identity to fit into a context that is very different from their own, and laden with ideologies that do not favour their presence (Bell, 1990).

Historically, the space of engineering has been White male-dominated; hence, the practice of male dominance, perpetuated by cultural norms and beliefs rooted in systems of patriarchy filtered through social and organisational institutions becomes a reality (Bullough et al., 2017; Booysen and Nkomo, 2010). Studies from as early as 1975 focus on perceived differences in female middle manager characteristics when compared to their male counterparts: it was posited that perceptions of what it meant to be a successful middle manager ascribed characteristics generally displayed in men, as opposed to those by women – "think manager, think male bias" (Schein et al., 1996).

History has shown that for a bicultural, racial association presents as the identity tag making them susceptible to oppression based on the colour of their skin. For a bicultural woman, a triple dosage of oppression pushes her further into the abyss because of her gender identity (De la Rey, 1997). Being women was one matter, but being women of colour subjected them to further restrictions on breaking through the proverbial glass ceiling (Ryan and Haslam, 2005, 2011). Black Coloured or Asian women who have been oppressed as a result of their many constructed identities carry the

burden of complex construal about self – something that women of privilege do not experience (Sanchez-Hucles and Davis, 2010).

Higginbotham (1992) states that in "societies where racial demarcation is endemic to their sociocultural fabric and heritage, to their laws and economy, to their institutionalized structures and discourses, and to their epistemologies and everyday customs – gender identity is inextricably linked to and even by determined by racial identity" (p. 254). This statement is significant, given that women were for the most part seen through the feminist lens as a homogenous social class; however, race and its social attachments have the effect of shading every woman differently through her differing experiences (Crenshaw, 1989; Hooks, 1989; Bell, 1990; De la Ray, 1997; Carrim and Nkomo, 2016).

Over time, this context has rippled into gendered roles in the home, coerced by cultural norms feeding into a patriarchally influenced value system. This was a system that informed gendered work in the workplace, influenced by perceptions of gender and what are deemed male-suited and female-suited jobs (Acker, 1990; Booysen and Nkomo, 2010; Bullough et al., 2017). This bias is evident in the engineering space to the present day (Hewlett, 2008). Participants' accounts of the gender bias they experienced daily indicate why the levels of self-efficacy that the majority find in a gender-sensitised home are so limited in the workspace. This environment poses, for these women, a space where negative experiences are born out of misogyny and gender-suffocation, leading to low morale and decreased levels of confidence, and thereby diminishing their levels of self-efficacy. So, how did a bicultural context inform these South African Indian women engineers' social cognitive processing (self-efficacy and outcome expectations)?

Hooks (1989) writes that: "Understanding marginality as position and place of resistance is crucial for oppressed, exploited, colonized people" (p. 21). With the likes of colonialism, apartheid and other oppressive systems, the most common salient culture is one premised on Western ideologies, turning those who hail from the Eastern parts of the world into biculturals who must find ways of navigating this "otherness" in two differing contexts. This navigation of the bicultural space drives the interplay between learning experiences and its influence on participants' levels of self-efficacy and social cognition.

SCCT theorises that self-efficacy expectations are formulated through four information sources, or learning experiences (Lent, 1994; Lent et al., 2000, 2006). In this study, based on the majority of stories shared by participants, the home became the primary source of information/learning experiences. The loose application of cultural norms created, for most of the women, childhood-to-adulthood experiences that presented their identity tags not as limitations but as empowerment. The strong socialisation process experienced by the majority of participants, with some participants' fathers motivating and encouraging them to not let race or gender hold them back, is perhaps reason why these women maintained positive thinking (social cognitive processing) and continued to be goal-orientated (action behaviour). Participants' stories depicted a healthy support structure, beginning in the home, that informed their early childhood to adulthood, and spurred in them positive social cognitive processing that drove high levels of self-efficacy and goal-driven action behaviour.

In terms of the four information sources, or learning experiences, which SCCT posits as being inhibitors or enablers, the applicable source—that is, methods of decreasing an individual's emotional state (physiological and affective states)—decreases to a point that compromises self-belief and negatively affects the participant (Lent, 2000; Lent et al., 2006, 2008). The primary source of learning (the home) made gender bias in the workspace apparent to participants, given their gender had not been a disempowering identity tag in their personal space, while presenting in this form in their workspace. Highly educated women tend to have a strong awareness of gendered inequality (Harnois, 2015b). According to Bullough et al. (2017) this is perhaps the greatest hurdle that women must face in terms of gender stereotyping, the more so when such bias is frequently unconscious, making it difficult to address (p. 212).

For the majority of participants, the organisation presented as an unhealthy environment, where a lack of support was evident through the silence maintained in the face of unequal, unfair, gender- and race-based negative encounters that these women experienced. Participants shared in their stories the high levels of pressure and stress this presented. At such points, some women, affected by their experiences of isolation, alienation and harassment, questioned their choice of profession. This introspection was not based on any belief that they were incapable of doing the work, but that their gender appeared to be making it impossible for them to survive in this male-dominated environment.

5.3.3 Research Question 3 – Decision to remain within the engineering field.

5.3.3.1 Summary of Findings.

Findings are offered in this section about Statement Three: the decision to remain within the engineering field. Two main themes presented, namely, survival mechanisms and passion for the career, opportunities afforded and financial empowerment. The participants' storytelling told of the different reasons they remained motivated to remain in their profession as engineers and the mechanisms they used to navigate this challenging playing field. Networking and group support, coupled with emotional intelligence and resilience, were the tools they applied and encouraged future female engineers to implement when entering the engineering space. Their accounts of why they remained in the field were informative, although concerns remain where these women still felt the need to prove themselves to achieve a sense of belonging in the engineering space. On a deeper level, this presents as a systemic challenge that organisations need to revisit in light of reinforcing a culture of gender neutrality.

Research Question Three investigated how social cognitive processing has informed South African Indian women engineers' decisions to remain in the profession. The main themes emerging from the findings that related to this question were, namely: survival mechanisms and passion for the career, opportunities afforded and financial empowerment.

5.3.3.2 Survival mechanisms and passion for career.

SCCT theory postulates that the individual's self-efficacy beliefs and outcome expectations influence choice of actions by acting indirectly on the individual's interests, choice and goals. These four information sources are the basis on which social cognitive processing is either positively or negatively affected and these effects are seen through the levels of self-efficacy and its articulation into outcome expectations, followed by career choice behaviour (Lent, 2005; Lent

et al., 2001, 2004). According to the experiences they narrated, social cognition was clearly informed by the levels of support these participants received from their information sources. Coupled with this, participants' stories told of the different reasons they psyched themselves to maintain their levels of self-efficacy, even in the face of adversity. This information provided rich data about the applied mechanisms that aided them to navigate the outcome expectations of this challenging playing field, and choose to not exit.

5.3.3.3 Opportunities afforded and financial empowerment.

For some participants, financial independence motivated them to remain in this profession.

> *What gets me up and to work and positive, is the fact that I need the salary. Um, if I had a choice, if my husband earned enough, I'd be more than happy to stay at home.* – PrEng09

> *No, it will just be the salary, basically.* – PrEng17

This raises a particularly interesting question. Was it perhaps the deeply embedded scars left behind by an oppressive history that informed this social cognition and action behaviour? The arrival of indentured and passenger Indians did not change the perceived role of Indian women for the Indian male. This was mainly owing to the religious doctrines that informed the cultural ideology dictating family dynamics in the Indian home (Meer, 1972; Jaga et al., 2018).

Their roles as mothers, wives, daughters and daughters-in-law informed their relevance in their community (Meer, 1972). Indian women had one purpose in the many identities they sported: the role of silence, subordination and marginalisation (Carrim, 2012; Govinden, 2008). Even if not experienced by these women themselves, but seen through their eyes, the experiences of women in their lives (their mothers, grandmothers, etc.) a racial and gender identity relegated them to the

status of caregivers and homemakers, thereby creating a dependence on males for livelihood (Meer, 1972, Govinden, 2008; Jaga and Bagraim 2017). Although these participants appreciated their good quality of life and for some, the choice not to have to work, their decision to remain in their profession with consequent financial empowerment was a stance or contingency employed to maintain independence and prepare to maintain this stance even in the absence of a male figure in their lives.

Some participants related their passion for this highly demanding, challenging profession and the self-gratification it offered. They stated that they had a passion for the type of work they were performing, how it influenced the world and the various other opportunities for mobility it offered that kept them motivated to remain engineers. This passion can, to a large degree, be an outlet providing a sense of self-empowerment through the ability to flourish in an environment that other women engineers find unbearable or intolerable, and society sees as unsuitable, based on gender.

When asked what motivated her to choose this profession, PrEng03 said it was:

> *…to challenge those that said you can't, to prove to them that [PrEng03] can and will. When I went on maternity leave, though, that was, yoh, that was something else, because now I feel like I have to work extra hard… because now I've got a baby. So between 16:00 and 19:00 it's her time. So then, come when she goes to sleep it's 19:00 and 21:00, so many times after 21:00 it's work. So that for me is… cause I have to work a lot harder and I work with men who are dumb, whose wives… I don't know if they don't work or they trophy… I don't know what it is. But I've been… I've had comments from the time I was pregnant like: 'Oh, you're going on a six-month holiday. It's a full time job. Now I've got two full-time jobs.' Because I don't want her look up and see me as, 'Okay, Mom, had a baby', and then Mom just gave up like lots of years of studying. Everything that I'm doing is for my child so that she can do whatever she wants to do.* – PrEng03

Kur and Bunning (1996) stated that choices between organisational worthy goals, and personal worthy goals, are critical decision-making moments. These decision-making moments are crucial to mobility within an organisation. For PrEng03 the passion for the work and the message it delivers to the daughter is what drives the reason to stay. For some, working harder was for them the only way to secure acceptance. A sense of belonging then came easily if they could prove that they could work as hard or harder than their male counterparts could. Therefore, what was initially an environment once offering only isolation and a sense of displacement now sees a woman as relevant.

> *It's just praying hard and working hard constantly*. – PrEng14

> *You know hard-core work. I had to be willing to, um, like I mean, despite any kind of diversity that I face, I had to be willing to work hard and demonstrate that I know what I'm doing.* – PrEng01

All participants stated that building and maintaining a resilient mind was something learnt along the way and not a skill they acquired in a Higher Education Institution. Learning experiences afforded a build on this tool that assisted one to be less emotional and more rational. This resilient mindset was a significant tool, especially in the environments within which these participants functioned.

> *So [the] only constant thing in life is change. You got to go with the flow and adapt yourself. Sometimes it takes some of us a little bit longer than others*. – PrEng08

> *It takes, um, resilience and… and confidence*. – PrEng01

It was necessary to not become emotional when faced with issues that placed these women engineers at a disadvantage because of gender or, in some cases, race. This is a tool that all organisations want employees to possess: a level of emotional intelligence that allows the person

to think rationally, critically and objectively, exuding high levels of resilience. For women in this field, emotional intelligence and a resilient mind are crucial tools, but must not be confused with acceptance of an organisational gender-driven culture and making this a normality.

> *I often emphasize emotional intelligence. You don't need to have like a list of degrees behind your name. You literally have to be… have common sense and... emotional intelligence.* – PrEng07

Having a network was another tool that participants appreciated, especially as given the demanding nature of the job, they needed a productive venting session.

> *I think that's the first piece of advice I would give young kids. For others [it] would be to seek out external support. And others in the industry, and to always be in a network. It gives you this support that you… because it's something… a tool that I never used then… Because I didn't know it… it was there… For me to use. And it… young people are more aware of these tools because they are more actively involved. And they have to work harder getting jobs. So I think you know to be in a network is probably the best advice I could give them.* – PrEng11

> *But at work for those four hours I was solid. Then I go for an hour lunch where I could call whoever. I make vent about what just happened and then I go back for my next four hours.* – PrEng10

Feelings of alienation and isolation in the workspace diminish when one has such networks. Networking and group support, coupled with emotional intelligence and resilience, were the tools they applied and encouraged future female engineers to implement when they entered the engineering space (Hewlett, 2008).

Participants articulated the need for organisational change if there was to be meaningful inclusion of women in this field. One participant, PrEng03, asserted it was no use having initiatives such as "Take a girl child to work" or the "pink hard hat initiative" if organisational culture continued to project maleness. This was a significant point, given that statistics show male-dominance in the

space with women occupying relatively few engineering seats (Commission for Employment Equity, 2017). Their accounts of why they remained in the field were informative, but raised some concerns, particularly where these women still felt the need to prove themselves to feel a sense of belonging in what they continued to experience as a male-dominated space. On a deeper level, this presents a systemic challenge that organisations need to revisit in light of reinforcing a culture of gender-neutrality. So, how then does social cognitive processing inform South African Indian women engineers' decision to remain in their profession?

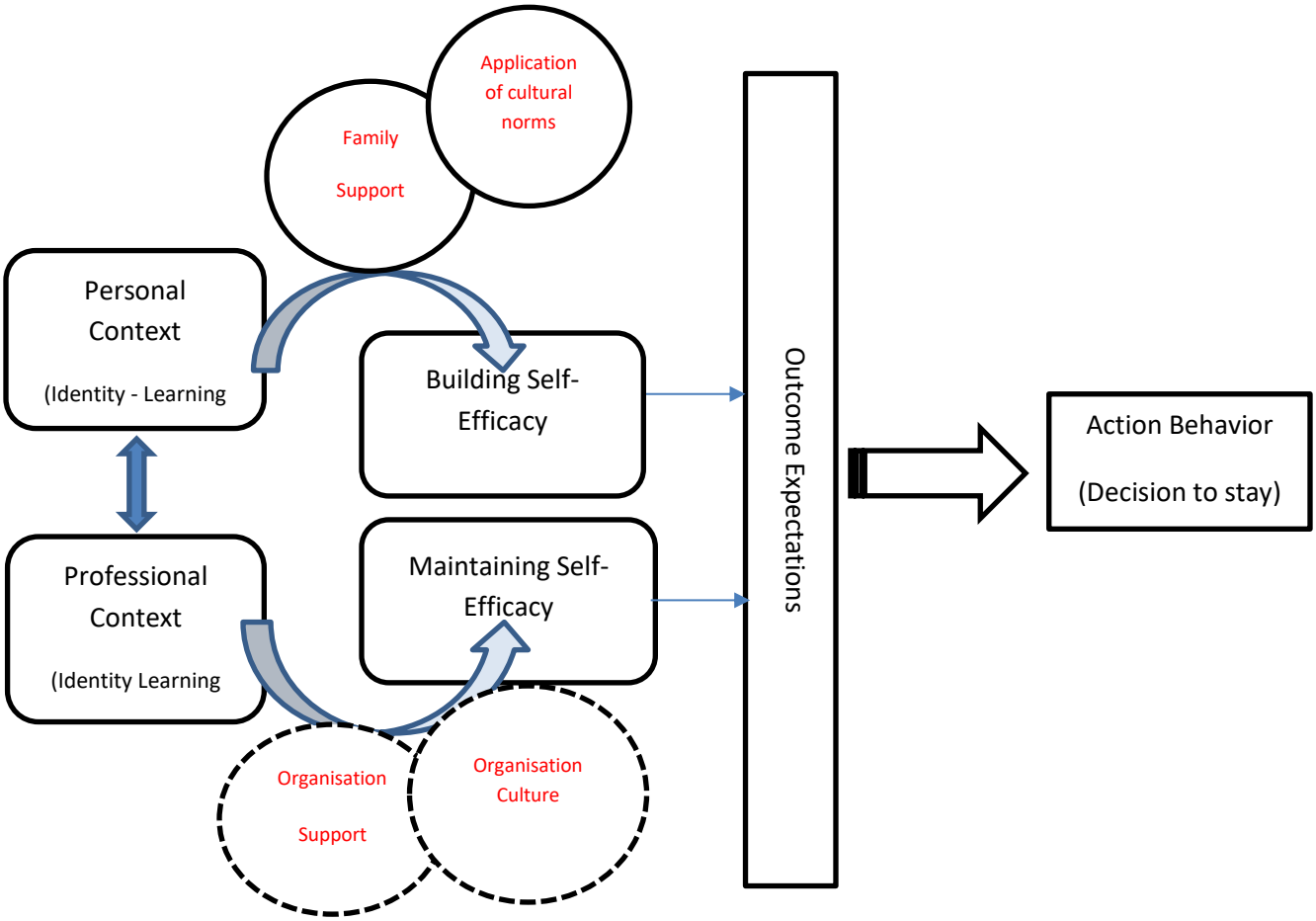
It is evident that these women participants are not ignorant of the current gender- and race-driven controversies in their professional environment. What their stories illustrated, however, was their unwillingness to let the proverbial glass ceiling, or macho culture, overrule their sense of self-belief and the goals they set for themselves in terms of career. Using tools such as networks and group support, emotional intelligence and resilience, they continue with the fight response, as opposed to flight. For some this is to secure livelihood and a career path. However, a significant proportion of the stories showed that the response was no longer an acute one, but instead an awakening of social cognition, enabling perception of professional space for what it is – a chronic illness that requires curing. Thought processes of these female engineers were now identifying a higher purpose in remaining in the profession: to balance the scales of representation and to create for those females that would follow, a professional space propagating meaningful inclusivity of women in engineering.

5.4 Main Contributions

Theoretical Contribution

Assimilation of the main concepts from biculturalism and social cognitive career theory informed a conceptual framework that mapped the trajectory of the study but also served as a basis upon which a nuanced representation of a Bicultural Social Cognitive Career Trajectory (BSCCT) was conceived. This BSCCT was conceived as presented below.

Figure 4: Bicultural Social Cognitive Career Trajectory (BSCCT), guided by Lent's SCCT model.



The representation above places *identity* as the starting point in the bicultural space. How identity is moulded in one, and respond to in the other, influences self-efficacy (self-belief), expected outcomes (goals set and achieved), and inevitably triggers action behaviour in terms of the choice to remain in the field. This model is plotted in relation to themes that stemmed from participants' responses.

Empirical Contribution

The life stories provided an empirical contribution, given that this sample of women does not feature in current literature on biculturalism and social cognitive career theory. This study supplements the current academic literature and gives voice to a specific group of minority women – South African Indian women engineers. The findings in this study of a minority group provide nuances relating to the literature on biculturalism and social cognitive career theory. Listed studies that formed part of this study's literature review explored minorities, but the context questions whether the findings of those studies on minorities can be associated with experiences of minorities in a developing Third World context. African American history and that of other minorities globally, share a similarity – that is, the oppression that comes from their intersecting identities. However, their personal contexts (*values, norms and cultural ideologies*) and how these interacted with the politics, economics and legality within their social context, differentiate their experiences from those of other oppressed groupings.

Their experiences therefore cannot be used as a representation of other minorities with their own unique personal contexts, coupled with their specific social context. The gap in the academic literature relating to South African Indian women in engineering and what motivated them to remain in their profession is what informed the conception of this research. The location of this study offers a contextual contribution, given that the emerging Third World does not often feature in the literature considering this phenomenon. In this way, the research gives a voice to a context that is absent from the current body of knowledge.

5.5 Conclusion

The researcher provided in this chapter an interpretation of the findings of this study in concert with the literature reviewed, incorporating evidence from empirical work conducted to provide a synthesised dialogue that attempted to answer the three research questions posed. Contributions are presented that add nuances to the current body of knowledge in the areas of Biculturalism and Social Cognitive Career Theory. This is presented as theoretical (Bicultural Social Cognitive Career Model), empirical (a sample that literature does not speak to), and finally as contextual (the experiences of the sample in a context (South African), that the literature does not cover.

CHAPTER 6: CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

6.1 Introduction

The current study was premised on the identity challenges facing women engineers and aimed to provide findings that spoke to the paucity of material dealing with a specific minority of women with a bicultural identity in the profession. This study sought to understand how a bicultural context influences social cognitive processing (a woman's motivations) and action behaviour (her decision to remain in this profession). The conceptual framework that guided the trajectory of this study was built on studies of biculturalism (individuals navigating two differing cultures), with an intersectional lens applied to understanding identity for an individual in a bicultural context. Principles of Social Cognitive Career Theory (SCCT), and specifically, levels of self-efficacy, were applied. This was executed through the use of the SCCT model of Lent (2017) to understand how identity informs a minority woman's bicultural context, and how self-efficacy within that context influences social cognitive processing (thought processing), which informs the action behaviour (choices and decision-making) of these women in engineering. This study applied a qualitative approach to the gathering of data through semi-structured interviews conducted with 25 South African Indian women engineers. The sample chosen has provided data that related academic literature currently does not offer. That is, data from a minority group of women with a bicultural identity. Women who come from homes that are noted historically for being governed by a patriarchy-driven cultural value system (personal space). Women now sporting a profession in a male-dominated arena (professional space) in a South African context.

The study endeavoured to answer three main research questions, namely: (a) how does identity inform a bicultural context for South African Indian women engineers. (b) How does a bicultural context inform South African Indian women engineers' social cognitive processing (self-efficacy and outcome expectations)? (c) How does social cognitive processing inform South African Indian women engineers' decision to remain in their profession? Main themes and sub-themes presented for each research question culminated in answers that provided rich literature relating to the areas researched. Below is a summary of each question in a conclusive format. The researcher will also provide a reflective journey as a conclusion to this chapter.

6.1.1 Summary of Research Question 1 – Conclusive Format.

Identity and the bicultural context of South African Indian women engineers

The findings showed that identity informed the experiences of these women's bicultural context. Experiences that were gendered-centred were based on societal discernments of the perceived role of women. These experiences triggered positive and negative responses in participants, dependent on the level of application of cultural norms and values in their bicultural context. Their identity tags and perceptions thereof created for these women an environment that enabled or disabled their navigation of their bicultural context. Socialisation (upbringing) of these participants, where gender was a tool of empowerment (enabler) in their professional space, presented as blockage (disabler). For many participants this presented as a challenge, making a fluid, effortless navigation near impossible. The multiple roles (daughter, granddaughter, wife, mother, sole breadwinner) they sported presented experiences where balance in the bicultural space was tipped, allowing one space to compromise the other.

6.1.2 Summary of Research Question 2 – Conclusive Format.

Bicultural context and South African Indian women engineers' social cognitive processing

Most of the stories told began in the home, where learning experiences were informed by the application of cultural norms, in a manner that created for these women, childhood to adulthood experiences that presented their identity tags not as limitations, but as empowerment. The engineering space was described as one where identity—especially gender and in some cases, race—impose a comprised social cognition. Narratives indicated the strong socialisation process that the majority of participants experienced from early childhood into adulthood. However, the emergence of the father as the motivator for some participants is an interesting development, which, until this study, remained an undocumented phenomenon. The significance of this finding is based on what has been historically known about this sector of women in terms of androcentric cultural systems. This finding is indicative of the cultural changes that are happening in the home space. This new motivator, and the changing nature of application of gender-driven cultural norms, are perhaps reasons why these women maintained positive thinking (social cognitive processing) and remained career-orientated (action behaviour).

6.1.3 Summary of Research Question 3 – Conclusive Format.

The decision to remain within the engineering field

These participants indicated through their stories that they were not ignorant of the current gender- and race-driven controversies that presented in their professional environment. Their response to this showed in their unwillingness to let the proverbial glass ceiling or macho culture overrule their sense of self-belief and the goals they set for themselves in terms of career. Using tools, such as networks/group support, emotional intelligence and resilience, they opted for the *fight* rather than

the *flight* response. For some, remaining in the field was driven by passion for the work, while others stated that it was to prove to those who saw them as unsuitable for this profession that they could do what a man does, and even more. A small number stated that financial empowerment and quality of life informed their decisions to stay in the profession.

6.2 Contributions

Theoretical Contribution

Integration of the two theoretical perspectives informed this study, namely, biculturalism and social cognitive career theory. Principles of both informed a conceptual framework that served as a road map to the empirical work of this study. Findings offered a nuanced version of Lent's SCCT model through a bicultural lens that assimilated the Bicultural Social Cognitive Career Model (BSCCM) as illustrated under point 5.4. This model plotted social cognition of a female engineer in a bicultural context and action behaviour that informed her choice to remain in her profession as an engineer. This research provides valuable insights to the engineering community, as well as private and public domain career counsellors, on what factors influence women to stay, and if responded to effectively can assist in detecting early onset "flight risks" and suggest how to manage these amicably. The factors identified provide management with an understanding of what motivates these women to stay and provides for future research by triangulating the data with data obtained from a different minority to establish if this is domain-specific or relates generally to individually driven career development trends.

Empirical Contribution

The life stories detailed in the course of this research provided an empirical contribution, given that they came from a sample of women who do not feature in current literature on biculturalism and social cognitive career theory. This study supplements current literature and gives voice to this specific group of minority women, South African Indian women engineers. Focus on an understudied minority group adds nuances to what is already known about this phenomenon. The studies forming the literature review for this research explored minorities, but from an international context. African American history and that of other minorities globally share a similarity with that of minorities with a bicultural identity – that is, the layers of oppression that come from their intersecting identities. However, personal contexts (*values, norms and cultural ideologies*) and how these interacted with the politics, economics and legality within their social context differentiate their experiences from those of other oppressed groupings. Such experiences therefore cannot be used as a representation of other minorities. The context of the participants of this study provides, through their narratives, their unique experiences.

6.3 Researcher's Reflective Journey

Where does one begin? I guess where it all started. I was born in Merebank, a small town that, as per the Group Areas Act No. 41 of 1950, was allocated to people of Indian descent in KwaZulu-Natal. My parents are both third-generation Indian descendants and spent the majority of their childhood and adult life during the apartheid era. I am the last-born child and have an older brother and sister. My parents were practicing Hindus and our home was governed by strict norms and values. My mother is a very conservative woman and she had rules on how we should live our

lives, especially as females of Indian descent: that is, morally, without bringing shame and disgrace to the family. My dad agreed with all of this, as respect and morality for him were values that he wanted instilled in us. However, he was the fun parent as well. To my mom's horror, he gave my sister and I our first alcoholic drink. Clearly, the liberal parent. He wanted my sister and I to grow up as strong, independent, modern women and not in a box that society had created for us. He told us of the hardships he experienced in his childhood, riddled with poverty and lack of parental care. His philosophy was: Live life at its fullest and if there is anything you should invest in, invest in yourself.

My mom used to tell us about the financial responsibilities she carried at a very young age to help her mom, with lots of childhood lost due to what she labelled as morally driven responsibilities to be fulfilled. She shared the same philosophy as my dad, but for her, it was a case of: Live your life fully but responsibly and do not disrupt the family status quo. As is the case with 99 percent of the Indian homes their son, my brother, was their prized possession. My sister and I made peace with this as we saw the same trend in our extended family, and other Indian families. My dad was employed as a driver and my mom was a homemaker, one with quite an entrepreneurial flair, adding to our environment with a third income obtained through initiatives of her own. This third income allowed my parents to buy a home when I was aged 13, my sister was 16 and my brother was 21. I think that was a beyond-happy moment, as I said goodbye to our rented home—a garage that served as a makeshift house—to move into a real home, knowing that I could finally say goodbye to that pink fold-up mattress.

The primary school I attended was predominantly Indian and high school was a mix of Black and Indian children. I attended school for Tamil (my mother tongue) when I was still sporting a diaper, as my mom always describes it. Therefore, my parents were quite driven to ensure that we knew our cultural, religious identity and that we lived it daily. My religion is very important to me and in my younger years inspired in me a love for semi-classical South Indian music and the art of Bharatanatyam, an ancient dance form and a form of worship to the Almighty. Both of these became a strong part of my transitional years from adolescence to adulthood. From a young age, I was very rebellious, and questioned anything that did not make practical sense to me, much to the annoyance of my mom as this constituted "back-chatting" to parents. My mom used to tell us we had to do something in a specific way. I would ask why and she would say: "Because they said so". I would next ask: "Who are they?" Her answer was a glaring stare; mine was a satisfied Cheshire grin.

Despite this rebellious nature, my love for my mother tongue and my religion prevailed. However, I always had a problem with how women were objectified and subjugated through religion and culture – ironically enough, by the interpretations of scriptures that were written by men. A subsect of the religion, of which I am an ardent devotee, worshipped a Divine Mother. Her representation, in the form of a *murthi* (idol), carved as the anatomy of a woman. Male priests offered *abhishegam* (holy bath) to this *murthi*, but deemed a woman unclean to enter the house (*mulasthanam*) where the Mother God was worshipped. This right was reserved solely to men or the male priest. If a woman was on her menses, she was not allowed to enter the temple, as this would be blasphemous. These biases did not sit well with me and at times I spoke out, which was frowned upon. My

parents knew how my sister and I felt about this, but it was so accepted by our community that it became ‘the way of life’.

Neither of my parents completed their schooling and for them, educating their children was the highest priority. Many challenges were presented in terms of finances but luckily, my father’s place of work granted me a bursary for two years of my tertiary education. This bursary allowed my older sister to complete her degree and qualify as a teacher. My father was unfortunately medically boarded in my third year. I stopped campus that year and worked odd jobs to help provide some form of income to the household. Resuming my studies and completing my first degree was a highly fulfilling moment in my life, but equally a daunting one, as I had to now find a job and begin contributing an income to the household.

This was perhaps why I took the first offer that came my way rather than waiting to find a job that spoke to my qualification. If I think about the wage I earned then, I almost want to cringe. As a young woman, my salary was handed to my mother, who utilised this for the needs of the home and provided me with my womanly necessities. I had no problem with this, as it was the way things always had been at home, even when I was in school and did part-time jobs as a means of contributing to the household. Then, a sealed envelope was handed to my mom – no questions asked.

Entering the workplace was terrifying. I had my first sexual harassment encounter in my first year, together with race-hate experience and gender bias. My response to all of these at that time was silence. Even though I was so vocal about how I felt regarding the hypocritical gender bias nature

of religious doctrines, this space was different. I had to still learn about its nature and the best ways to respond that would place me in a comfortable space.

I married in 2003 and relocated to Johannesburg, in Gauteng. The first few years were overwhelming with me trying to adjust to this new life, of being a wife, a mother, away from home, trying to make this new space my home. I quickly learned that gendered norms infiltrate one's life as an Indian woman no matter how much one tries to deter them. Suddenly I missed my music, my dance – I missed *me*. The *me* that would not allow my value as a woman to be validated on how well I cooked a curry or rolled a roti. Marriage was tough, motherhood tougher, especially when there were onlookers—sadly enough, most often women—who passed judgement on one as being an unfit wife or a bad mother. All this judgement because you speak your mind, which makes you a disrespectful wife, or you have to work because one salary cannot maintain the home, so leaving your child in the care of others whilst you went to work and 'taking a beating' for a wage is shirking responsibility and you are therefore a bad mother. I wondered, through all of this, how the very gender that should be giving support was the same that gave importance to the male in my life and rendered me 'just a woman'.

I resumed studies after 12 years and this was my saving grace. Job prospects got better, and I climbed the ladder even if it was not the one I had dreamt of climbing. I was financially empowered, confident about myself, once again unafraid to be candid, in control of the trajectory of my life. Silence no longer featured in my vocabulary. Life stopped for me on 30th December 2015, though, when I lost my dad. This was the most harrowing experience of my life. I found a little of myself being lost every second I grieved. I sank deep into this painful abyss and my only

company was the memory of that last breath taken, on a continuous replay. One morning I woke up and his words reverberated in my head: "*If there is anything to invest in, invest in yourself*". I lodged my application to study for a doctorate in the same week, motivated by the spirit of my dad and cheered on by an old friend. Her name is me, myself and I.

6.4 Limitations

As with many other studies, this research is not without limitations. Firstly, the sample used for this study focused specifically on South African Indian women engineers. In South Africa, there is a population of foreign nationals who share a heritage with the women in this study. However, birthplace presents as the contextual difference that makes the experiences of women in this study unique to South African Indian engineers. Secondly, there was the geographical issue that was not fully met, as had been envisaged at the start of fieldwork. The aim was to have participants from all nine of the country's provinces. However, even with the snowballing technique applied, women referred to the researcher as eligible candidates hailed solely from the provinces of KwaZulu-Natal, Gauteng, and the Western Cape.

The narratives are therefore not representative of all South African Indian women engineers. South African Indian women engineers in other locations may have nuanced experiences differing from those of the current participants. This notion is based on participants' advising the researcher that Black Economic Empowerment is implemented and experienced differently based on the province within which one resides/works, and this can work for or against one as an Indian woman. Thirdly, in terms of interviews conducted, face-to-face was not always possible, especially where the

participants did not reside in Gauteng. Skype, Zoom and WhatsApp calls had to be used in these instances. However, these platforms were not without their own challenges, in terms of latency and server issues that caused disruptions while interviews were in progress. Travel costs, family commitments and work commitments were the main reasons preventing the researcher from meeting with participants out of Gauteng. Availability of participants had to be taken into account as all had very busy diaries and some family/parental responsibilities. As a result, the researcher had to take her place in the queue to find what was most conducive to their needs, and adjust accordingly.

For example, some participants preferred to have the interview done after hours when their child/ren were asleep, so that they had uninterrupted time. Others preferred to be interviewed on a workday, in a slot in their tight schedules. Two interview sessions had to be cancelled. One cancellation was caused by a participant's family commitments, while the other was caused by the researcher's ill health. Sometimes, interview recordings were noted by the transcriber as being "inaudible", but a second listen to the recording in conjunction with the transcript, as well as the interview schedule which contained notes made by the researcher during the session, assisted the researcher to make sense of the content.

Finally, there are the personal challenges that can also throw the proverbial spanner in the works. The researcher started a new job in March 2019 in an environment very different to the one experienced for almost 13 years. The year 2019 involved a standard probationary period, as is the case for any person in a new position. This was a stressful time for the researcher, having to assimilate to a new environment and at the same time balance family and study commitments. As

the researcher entered 2020 and felt more at ease in the work environment, Covid-19 reared its ugly head. This pandemic presented workplace disruptions requiring the researcher to work from home, overseeing a staff compliment of four people. These were definitely uncharted waters. The researcher now had to find ways of dealing with a national lockdown and work remotely without comprising work continuity – all coupled with managing a home, two kids with online learning, and while at the same time facing ongoing health challenges. Depression, stress and anxiety were inevitable and impacted heavily on the momentum of the study.

6.5 Recommendations for Future Studies

The researcher would champion numerous research projects taking their lead from this particular topic. Firstly, it would be interesting to carry out an investigation involving comparison with the same type of sample, but looking at the other side of the coin, that is, South African Indian women engineers who have exited the field. Such a comparison would emphasise the nuances in the social cognitive processing and action behaviour of women who stay and women who leave. A dialogue on the social and organisational levels could then produce suggestions about ways to alleviate the high attrition rates of female engineers.

Secondly, life stories that spoke to the experience of being the first female engineer in a team of men and their reaction, which was decribed as ‘walking on egg shells’ because it was a novel experience for them. Interesting research that could come out of this would involve investigating the male engineers’ perception of women in what has historically been deemed “their space”. Such an investigation might develop interesting viewpoints about how male engineers interact with

female engineers in an engineering space and the meaning a woman engineer attaches to male engineers' interaction with her. Findings might demonstrate whether the meaning attached by a female engineer to the interaction she has had with a male engineer, is an accurate reading by her of what the male engineer's intention actually was.

In this instance, perceptions are under the microscope, and how these can be easily misconstrued based on an individual's socialisation process and experiences, stemming from the process that informs social cognitive processing. The process called "armouring" by Bell and Nkomo (1998) might find its way into such a proposed study. Armouring as a socialisation process refers to girls being taught by their mothers how to protect themselves in their bicultural context. Finally, an unexpected find in this study related to the role of a father as motivator and being supportive of the participant's career choice decision. It was unexpected, as most of the literature consulted for this study speaks to this figure as the headman in terms of his role in sustaining male dominance and maintaining the subservience of Indian women. It would be gainful to understand this change in a community that historically has been known for strong patriarchal value systems being enforced in the household. In this new case, the patriarch now assumes the role of motivator and supports empowerment and agency for these participants. Perhaps this variable needs exploration when the comparative study is underway with South African Indian women engineers who have exited the field. This would establish the power such a variable holds in the social cognitive processing and action behaviour of South African Indian women engineers.

6.6 Practical implications

The findings of this study lead to numerous practical implications. The experiences narrated here are not just stories to be read, but voices to be heard of women in a space where meaningful inclusion and relevance still presents as a "leaky pipe" (Dasgupta and Stout, 2014). These voices are giving women in the space who share similar experiences the courage to choose fight rather than flight and list the tools they have used: these are tools, which future women engineers can use to stay in the game and not exit the playing field because of pressure induced by gender or racial bias.

The disturbing site and office experiences described by some participants that involved physical and sexual harassment are mainly what drove the implication to be shared below. Participants alluded to the lack of preparation they had received from their respective Higher Education Institutions in relation to the gendered dynamics they encountered when they entered the workspace. The researcher intends to draft a proposal to be presented to Higher Education Institutions for an Action Learning Programme (ALP) that should form part of the curriculum for the final year engineering experience. Content and structure of this would be created through collaboration between active champions for women in the STEM environment (WIMSA, WomEng, etc.), third-party business institutions that focus on empowering women (BWASA), engineering bodies (ECSA, SAICE, etc.) and the Higher Education Institution (HEI). The aim and objective of this ALP would be to provide a five-day visit to a live site, where simulated scenarios would be presented. The engineer would be teamed up with a colleague from the cohort and a senior individual on the site. This syndicate group would then work on the simulated scenario and present a case to higher-level engineers and academics for the HEI.

The desired result is twofold. Firstly, this module would infuse in the female engineer's psyche a sense of belonging, after which assimilation to this environment would happen more naturally. This space, when entered at a later stage, would not present as alien to a woman, and navigating in the environment where simulations are now real-life scenarios would be a fluid, seamless process. Secondly, this interaction would also prepare individuals, especially males, on site to become accustomed to having the opposite gender on the playing field. The idea of working together, regardless of gender, on the field as a team becomes less daunting and more digestible.

Finally, the story by one of the participants that related to challenges presented by maternal responsibilities is what informs this implication. Women's multiple roles must be considered when policy documents are written. Understanding this would result in a document that is inclusive of all the people in an organisation. A one-size-fits-all approach is not healthy for an organisation, as its message to its people is one of disregard. The personal responsibilities of men and women engineers that are tied to the roles they play in their personal space must be considered. In the Indian home, the mother of the child is "expected" to see to the child's needs while father's role has been to work and provide for the family. It seems this generational divergence in parenting roles still prevails. In an era where women were not allowed to be a part of the working world, as biased as this notion is, it would have at least been backed based on practicality. However, in the 21st century, where women are now engaging in work that was previously deemed only suitable for men, childcare is still a "woman thing". This case could be presented for some participants who did not see this as problem in terms of having to see to their children's needs.

The challenge comes when an organisation is rigid in its rules and uninterested in how this affects the employee. The same can be said for single fathers or relationships where the father attends to the child's needs. Situations arise where employees are advised that attendance at work is necessary even if their toddler is in theatre undergoing a surgical procedure: such a response, irrespective of whether it is made to a male or female engineer, is heartless. It should come as no shock when the employee output drops or the employee chooses to move to an environment where it is understood that they have responsibilities over and above the work they need to perform to secure profit for their employers. This variable has the potential to change the positive social cognition of a hardworking, committed employee. For women engineers who are mothers this presents as an area of vulnerability and it may push them to exit such an environment in favour of one that is less demanding and allows them to fully harness their identity as a mother. Hence, policies have to be written in a gender-sensitised and inclusive manner.

6.7 Theoretical Implications

In terms of biculturalism, the findings of this study support the argument of Bell (1990) that a bicultural identity, or bicultural space, triggers bicultural stress, rendering navigation between two different ideological contexts a difficult feat. The stories presented by all participants confirmed this as a constant in their personal and professional roles. It applied in terms of identity and the participants' socialisation process that fed into their levels of efficacy through the unexpected rising motivator. Given that most of the literature reviewed on Indian women's socialisation process (upbringing) is premised on gender-oppressive value systems that were androcentric in nature, the motivational role evidenced by participant's fathers was an unexpected finding. There

is a dearth of research material documenting this phenomenon, leaving room for further research that would investigate this phenomenon at a deeper theoretical level. Evidence indicated that in line with Social Cognitive Career Theory, levels of self-efficacy influenced outcome expectations that ultimately determined action behaviour from participants. In the current study, the support from motivators in the home space created an environment propagating positive levels of self-efficacy and action behaviour in the participant. Assimilation of the main concepts from biculturalism and social cognitive career theory informed a conceptual framework that mapped the trajectory of the study, while also serving as a basis upon which a nuanced representation of a Bicultural Social Cognitive Career Trajectory (BSCCT) was conceived, guided by the Social Cognitive Career Model of Lent, Brown and Hackett (1994).

6.8 Practical Initiatives in Progress

What started as a purely academic investigation had life breathed into it through the stories shared by participants in this study. The bravery exuded by these 25 women, generated a newfound purpose in the researcher. This new purpose includes the fight for silent voices to be heard and the continuing struggle for the empowerment of women. The researcher's initiatives in progress, as presented below is, are beautifully and profoundly captured in the words of Brené Brown (2018) in her book *Dare to Lead*:

> *To be the person who we long to be – we must be vulnerable. We must take off the armour, put down the weapons, show up, and let ourselves be seen. At the end of the day, at the end of the week, at the end of my life, I want to say I contributed more than I criticized*.

During the interviewing phase, the researcher made LinkedIn connections with WomEng and WIMSA to keep abreast of new data pertaining to women in the relevant environments. This platform proved useful and the researcher noted that this would be a route to engage with relevant stakeholders regarding the Action Learning Project proposed under section 6.6 above. The researcher currently works at a Higher Education Institution (HEI) and prior to this was at a different HEI for 13 years, so in this instance, networks would not pose a challenge. The Businesswomen's Association of South Africa (BWASA) was added as a contact on the same platform. Engagement would follow once the researcher has achieved readiness with a proposal on taking this ALP forward.

The researcher was invited by one participant to present at a Woman's Day Event hosted by the South African Institute of Civil Engineers (SAICE) Environmental Engineering Division in 2020. Both male and female engineers attended the event. The researcher used this opportunity to advise the audience on the anecdotal evidence that informed the topic and the literature guiding the conceptual framework and methodologies. A few participants expressed interest in reading the product, as the researcher advised that findings could not then be shared given that the research had yet to be examined.

Figure 5: SAICE Environmental Engineering Division – Women's Day Event (2020)



Source: SAICE

The researcher was recently nominated by her current place of employment to attend a Women Leadership course ending in August 2021. One requirement of this course was for syndicate groups to execute an Action Learning Programme. The researcher attempted to use this opportunity for some groundwork on engineering graduates' post-qualification experiences, and the role of higher education institutions. With group dynamics involved, it had to be a topic with which all members were agreeable. The agreed sample, in this instance, comprised Grade 9 females with an affinity for courses that were STEM-related. The researcher was in the end satisfied as it did speak to a space that was close to her heart and her knowledge base was wide as a result of the current study. The researcher knew this was a space where she could contribute positively and make a difference to a problem affecting young girl children.

The researcher recently engaged with the Head of Research, Assurance, HR Audits and Financial Control at the South African Board for People Practices (SABPP) regarding the current study. The Head of Research expressed interest in the area of research and in the possibility of publishing in the SABPP factsheet or the board's *People Factor* magazine in a way that would not impede academic journal publication.

6.9 Conclusion

The journey has been long and strenuous. However, it has brought to the forefront voices that were once not heard, but now are in the open for all to hear and reflect upon as the lived experiences of 25 South African Indian women engineers. Antigens, as stated in *The Athena Factor* (Hewlett, 2008), from the evidence provided clearly produce a septic wound, which repeated attempts have failed to cure. Acute responses must be applied if the cavity in the engineering space, as expressed by PrEng01, is to be completely filled. Many women reading this may identify, for them, a mirror image of that which they are currently experiencing in their space of home and work. The brave stories told stand as testament to the armour these participants donned in their bicultural space as means of facing the reality of the situation and taking one-step closer to the door: this was the easy option, but they knew it would not be the right decision. Taking off their armour, these participants chose to harness spirit and strength to fight the good fight.

The researcher feels a strong sense of connection to the writings of Stella Nkomo, cited here, in which her remarks about *armouring* resonated with the experiences of the participants, as women of colour, navigating identities in a world where gender equity is moving at snail's pace. Social

media showcases, for the viewing pleasure of women and gender activists, the great strides made by women or the accolades they receive, referring to “the first woman to be this or that”. This has people giving a thumbs-up or posting heart emojis. The researcher was one of these smitten activists who gave an emoji to every post about such strides. On concluding this study, however, the researcher reacted differently when presented with such posts, instead posing a question: Are these not feeble attempts to declare such small and few wins as big achievements, evidence that gender equity is gaining momentum? Is this not camouflaging the reality of the gender challenges that persist for women in the home and the workplace? If we need organisations formed as ambassadors (WomEng, WIMSA) for women in spaces where their inclusiveness is presented as balancing a tightrope while blindfolded, then surely this is proof enough of the long road ahead with many miles to cover before the desired equity is obtained. So in the words of William Shakespeare, “*to be or not to be”* is the question that every women poses to herself before she speaks her mind or acts out her thoughts – a self-imposed cage that makes her question her belief in herself, based on the contradictions of others about who she ought to be. The answer is simple: Just be!

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ANNEXURE A: LETTER OF INVITATION AND INFORMED CONSENT FORM



Letter of Informed Consent

My name is Vanishree Pillay, and I am a PhD student at the Graduate School of Business Administration, University of the Witwatersrand. This letter serves as an invitation for your participation in my research study for the PhD programme. Kindly note that participation is voluntary.

My study interest lies in learning more about the bicultural experiences of Indian women who are qualified and employed as engineers, and socio-cognitive linkages of these experiences to remaining career-orientated. It is perhaps important to, at this point, explain what biculturalism means. This phenomenon refers to a person (a bicultural) living and functioning in two very different cultural contexts. In the case of this study, the two contexts to which is made reference is one, a South African Indian woman's personal context which constitutes home, family, community, religious beliefs, cultural ideologies with its own set of rules of engagement and expectations of an Indian women, second, is a South African Indian women in her professional context which constitutes her place of work, the people with whom she interacts in her workspace, a context that has its own set of rules of engagement and expectations.

I am therefore writing to you as a South African Indian women engineer requesting your participation as you are an exemplar, in terms of the valuable input you can provide that will add significant value to the study. You will be asked to attend an interview session on a date, time and venue that is convenient for you. This interview will take approximately two hours of your time. All information will be kept *confidential*. I will assign an alias to your responses, and only I will have the key to indicate which alias belongs to which participant. In any articles I write or any presentations that I make, I will not reveal details or I will change details about where you work, where you live, any personal information about you, and so forth, so that other individuals may not be able to identify your responses to my questions.

As a South African Indian women who is an engineer, your participation will be beneficial to this research as your experiences and will help readers to understand **Bicultural Life Experiences and Career Orientation of South African Indian women Engineers,** which is the title of my research. The risks to you for participating in this study will be associated with sensitive questions posed about your personal and professional life. However, I want to guarantee you that these risks will be eliminated by ensuring that your identity is kept confidential at all times. If you at any time feel a sense of discomfort or reluctance during the interview session, you reserve the right to request that the interview be halted and you be excluded from the study, or not answer a question or questions that you are not comfortable to answer. If you choose to exit the study, all information collated from your interview session will be disposed of with immediate effect. All interviews will be shared with my supervisor, Dr Zanele Ndaba, who will ensure that your information remains confidential.

Student Information

Name: Vanishree Pillay

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Tel: 0832701716

Supervisor Information

Name: Dr Zanele Ndaba

Email address: zanele.ndaba@wits.ac.za

Tel: 0832701716

Participant

All of my questions and concerns about this study have been addressed. I choose, voluntarily, to participate in this research project. I certify that I am 18 years and above of age.

Name of participant

_____ _____

Signature of participant Date

_____

Name of investigator

_____ _____

Signature of investigator

ANNEXURE B: SEMI-STRUCTURED INTERVIEW SCHEDULE

Introduction

This is an interview session dated …….. at ……. that is for data collection purposes for a study entitled: Bicultural Life Experiences and Career Orientation of South African Indian Women Engineers. Before I proceed, are you comfortable with the session being recorded for transcription – note-taking purposes? (YES/NO)

Please confirm that you are in this interview session of your own free will and not through to any form of duress. (Yes/No)

As previously advised in the informed consent letter, and as a reiteration, please note that the details and data of this interview will remain confidential at all times.

Section 1 – Demographic Information

Name	
Age	
Gender	
Education *a) What type of school did you attend? (predominantly Indian or European)* *b) What were your expectations in your school day about where you would be professionally?* *c) What influenced you career choice?* *d) What was your experience of university?*	
Marital Status *(Married, single, divorced, engaged)*	
Occupation	
Place of employment	
No. of years of working experience	
Province you reside	
Issued Participant No /Alias	

Section 2 – Interview Question

Research Question 1

How does **identity** inform a bicultural context for South African Indian women engineers?

Sub-questions pertaining to Race and Gender in Context 1 – Social

- Are you married and do you have kids?
- Do you have a lot of friends and do you socialise much?
- What are your family's view on the role of Indian women?
- What do you think made them think in this way?
- How did the way they perceived the role of an Indian woman resonate with you as you grew from a young girl, into a woman, a woman who became an engineer?
- Do you have siblings? Are they professionals as well? What do they think about your profession as an engineer?
- What would say motivated your choice of profession?
- How would you describe your family and community's reaction to this career choice?
- How did you deal with someone in your social space disagreeing with your choice of profession?
- How would you describe yourself in terms of identity and interaction in your social space (i.e. family and community)?

Sub-questions pertaining to Race and Gender in Context 2 – Organisational/Professional

- Tell me about what informed your experiences when you entered the world of engineering as an Indian woman?
- How did the environment make your feel about yourself, or see yourself as a professional woman engineer?
- What would you describe as challenges for minority women in the engineering space? Can you share your experience of this and how did this make you feel?
- What would you label as highlights for you in your role as a professional in the organisation?

Research Question 2

How does a **bicultural context** inform South African Indian women engineers' social cognitive processing (self-efficacy and outcome expectations)?

Sub-questions

- What has been your experience of women and men in your family and community seeing you as a role model for the home space and community?
- What has been your experience with men and women in your work environment in terms of the value they afford you as a professional engineer?
- What has been your experience working amongst people with differing gender and race to yours?
- Describe a scenario where you have felt that your identity as an Indian woman compromised a relationship in your professional and personal space.
- Describe some of the ways you manage your relationships in your professional life.
- Describe some of the ways you manage your relationships in your personal life.
- Describe a situation where you felt that you have neglected one at the expense of the other *(work life for family life or vice versa).*

(follow-up) How did this make you feel?

(follow-up) How did you manage to balance the imbalance?

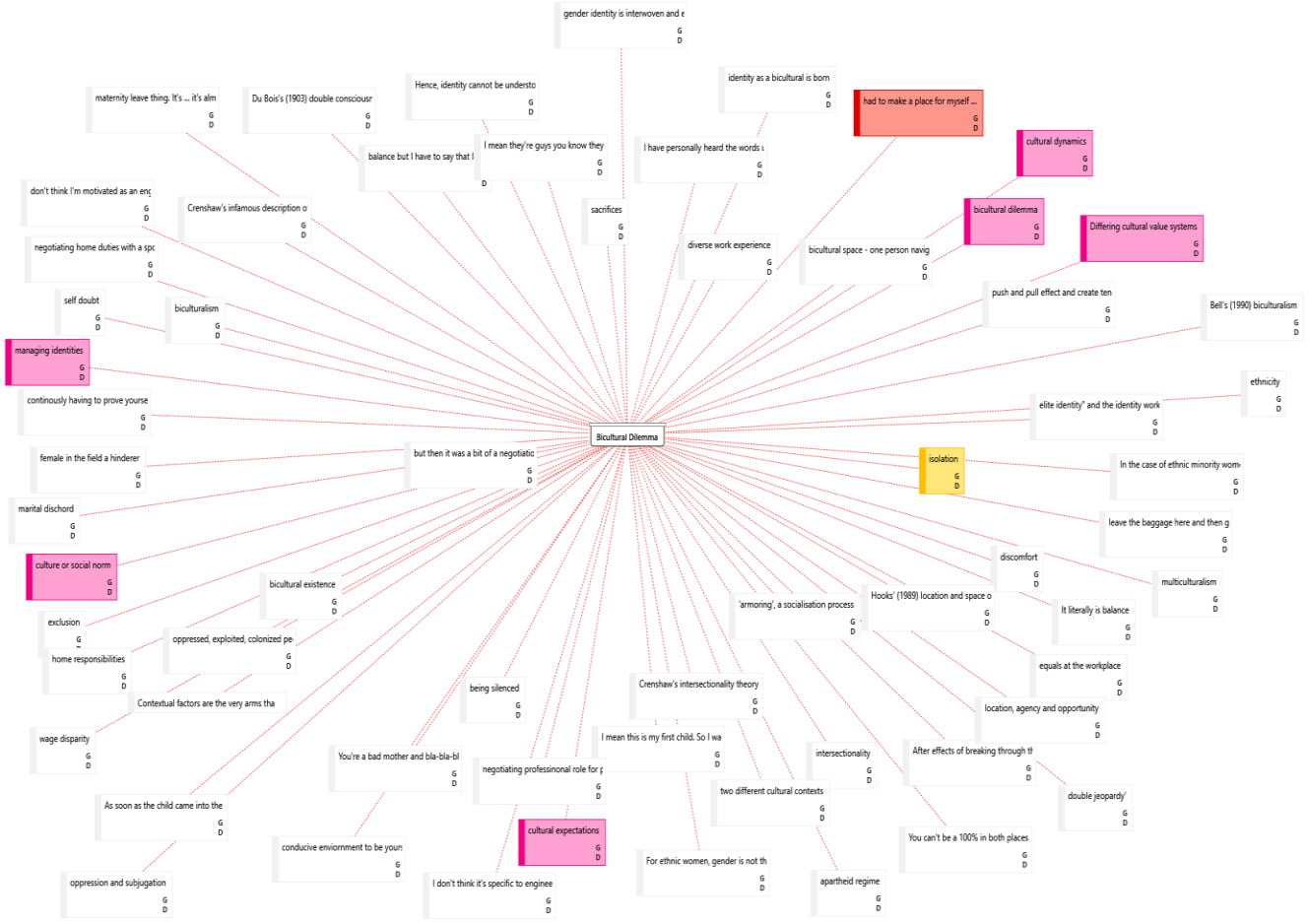
Research Question 3

How does **social cognitive processing** inform South African Indian women engineers' decision to remain in her profession?

- What motivates you to remain as a professional engineer?
- Describe if and how your personal space (home) motivates you to continue with your profession?
- Describe if and how your professional space motivates you to continue with your profession?

- Was there ever a time where you felt like quitting as an engineer? Tell me more about what led to this and how did you overcome this moment?
- Have you ever thought of changing your profession or been placed in a position that made you consider leaving or changing? Tell me about this experience.
- What has been your secret to remaining career-orientated?

ANNEXURE C: ATLAS.ti NETWORK ILLUSTRATION



ANNEXURE D: EVIDENCE OF TRANSCRIBED INTERVIEW

NAME OF AUDIO	:	**Interview 010**
DATE OF AUDIO	:	**12/03/2020**
LENGTH OF AUDIO	:	**46:23**
TRANSCRIBER NAME	:	**RHODA JACOBS**
TRANSCRIPTION LEGEND	:	**RESEARCHER R**
	:	**INTERVIEWEE I**

R	Um this is an interview session dated 15th of November at Eskom that is for data collection purposes for a study entitled "Bicultural life experiences and career orientation of South African Indian woman engineers". Before I proceed, are you comfortable with the session being recorded for transcription purposes?
I	Yes.
R	Please confirm that you are in this interview session of your own free will and not through any form of duress?
I	That's correct.
R	Okay. As previously advised in the informed consent letter and as a reiteration, please note that the details and data of this interview will remain confidential at all times. Okay.
I	Okay.
R	So I think I mentioned in the letter that the only person that will have access to the information here, so your … your transcribed document, will be my supervisor.
I	Okay.

I	35.
R	35. Still a baby.
I	[Laughter].
R	Okay. Um married. Any kids?
I	Two kids.
R	Two kids. Okay. School going kids?
I	Yes. Aged four and six.
R	Oh my gosh shame.
I	Yeah. [Laughter].
R	[Laughter]. Oh yeah. Um occupation, what can I put your title as?
I	Integration engineer.
R	Integration engineer. Okay. Place of employment? Eskom. And number of years um in totality of working as a … as an engineer?
I	Um 2005, how many years is that?
R	You're asking a bad pers … I was bad at maths.
I	Yeah, me too. It will be fourteen years.

ANNEXURE E: EVIDENCE OF NARRATIVE CREATED

Narrative – PrEng 10

PrEng10 is 35 years, married with two kids. She has 14 years of experience as an engineer. During her childhood years her family travelled a lot so she attended different schools and this was due to her father's profession. Her father was an engineer. She had three career streams in mind and received a lot of exposure to information around careers as her father always took her and her siblings to the open days at the universities. She researched the fields she was interested in and said that she later realized that architecture was not was she thought it would be so she ruled that out and after watching a video of what surgeons do, she realized that was not for her so she opted for engineering. She spoke about how she used to go to her dads office and be curious about what he was doing. She advised that he was very senior at that time but more in management and not so much full on engineering but the projects that he spoke about was very influential in her choice of career. She also stated that her father never forced the career onto her just because he was an engineer but told her that whatever she chooses her family would support her.

Her upbringing was not bound by strict traditional rules as he parents were very liberal when it came to education and career. However, her father did set rules. She spoke about a matric dance and her dad giving her and her sister a curfew different to that of her brothers. Her dad's explanation for this was that statistics show that women are more vulnerable than men to violence etc. so she could not really argue with that because it was just genuine care and not a sort of dominance or control just because of her gender. Though she did see some of that traditional thinking come from her mother when she married her husband who is coloured. Her mother did not speak to her for a month. She says her mom eventually came around. Her family were very supportive of her career and in terms of extended family, there was not much interaction so they did not engage much for her to be able to comment on how they would have reacted to her career choice.

When she spoke about her experience upon entering the world of work. She termed it as it being "hardcore and the hardest point in my life". She stated that her school life and even university were great but both never prepared her for entrance into the world of work for her profession and the challenges she would face. She stated that going on site was a very horrible experience as you are constantly undermined, shunned, isolated. The field services guys that were there treated her with high amounts of disrespect and there were times she felt so lonely and unwelcomed. She luckily never experienced some of what others did that had to end of in grievances lodged. For her it was more her voice in meetings being blocked out or if she needed a signature they made her literally run around in circles and wait till they were 'ready'. Three months into this and she was already considering quitting and moving into finance or some other field as she never knew she had signed

up her skills to sit in a “grummy gross power station with horrible people”. After speaking to the HR lady there she was told that this the norm and that she must just stick it out, the worst is almost over and that the people who have been treating her badly will come around, eventually. If it got worst or unbearable that she must let HR know.

She spoke about the way Indian males tried to show dominance, whilst the white males just completed ignored her. She called on her resilience and understood that these personalities were being that way either because they were racist or that they were older than her and just did not want to teach her anything. She said she understood this but there were days when she went home and just cried and put in sick leave days because of the metal toll this took on her. she had to ensure this for 9 months and finally entered an office space which she stated was a wonderful work environment. There were only 2 females but the experience she had on site to the one she was having in the office environment were world apart. She spoke about the isolation and alienation she felt when she was on site not knowing which group she could sit with – so there was no sense of belonging which made it 9 months of isolation.

She stated that she would never encourage her daughters to become engineers and if they even thought of it she would give it to them straight about what they would have to deal with so they can make an informed choice and not go in blind. She expressed that it is only after about 5 years into being an engineer that it actually becomes easier. She can now walk into a meeting and speak about work without having to feel judged or gunned after as it was when she was young, and new to the field. She was told by colleagues of hers that had changed from engineering to something financial that in their environment they were treated so well and there were no such thing as you had to work super hard to prove yourself to earn respect. But as she explained after 5 years her environment and how she engaged with it got much better.

Her family and community she advised see her as a role model. She spoke about the values she is entrenching in her two daughters and she relates this to how her father raised her and her siblings. He was the only individual from his family to educate himself and when she was born his whole look on life and what he wanted for his daughter informed a lot of his thinking in how he raised her and her sister in always reaching for whatever it is they wanted and not to ever be on the back foot or undermined by anyone because of their gender. She described working with people from differing gender and race as a wonderful experiences and she stated that her interaction is on a very human level. Having diversity in her work environment she explained is rewarding as there are so many varying ideas that are on the table and one can see this as a platform to learn and grow.

She explained that she tries to maintain a good balance between family and work but this is not always possible. Being a mother has brought many responsibilities and the workspace or people in that space are not sensitive to this. She related her experience after her maternity leave and the expectations that were placed on her. She stated that the general attitude by the majority was that she was on a vacation when she was on maternity and she felt that all eyes were on her now that she was back to see if she will falter. She described how she had to express milk in her manager's office and keep these in the fridge as she was still breastfeeding and it was becoming almost impossible to trek from work to home everyday to feed her child. She made reference to the policies within the institution or the lack thereof that is sensitized to women's different roles, more especially when she becomes a mother. She felt that there were so many things that the organization needs to change that they are completely oblivious to. She advised that her husband is also an engineer but most often the responsibility of caregiver to their child fell on her and this she didn't mind at all but she had to take flack for her place of work. She had to make an arrangement with her mother and her husband's mother to come and stay to look after her baby so that she could put her baby in a crèche only when she was a year old. She has learned that she has to create boundaries and that she has no control over how people act only how she reacts. She stated that even their general attitude is frustrating in that there is a stereotypical view that they have off women that as soon as you voice something that is not in order then label it "you being emotional'. These mindsets and responses still persist.

She has also learned that she has the power to control how these cavities in the industry affect her. hence she stated that when she leaves work, she leaves work baggage at work and goes home to enjoy her family. When she is back at work she takes on the baggage and knows that she only has to do it for 8 hours. She has decided to give her life this balance and not to let one seep into the other. She stated that it was the job that keeps her there and not the people. She loves what she does and the different things that it opens her up to. She labelled her dad as her initial motivator but herself as the person that motivates herself to remain in the profession. There was no one I her professional space that motivated her to remain. She advised that she did not want to do this till 65, maybe till about 40 – 45, and thereafter she wanted to do something that is a personal