



School of Management Studies

**Anticipated work-family conflict among STEM students: the role of core
self-evaluations and parental role modelling**

By

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Abstract

The present study examined the role of core self-evaluations and parental role modelling on STEM students anticipated work-family conflict. Anticipated work-family conflict is the conflict students anticipate experiencing between their work and family roles in the future. Core self-evaluations is an individuals evaluation of themselves or their abilities. Parental role modelling was examined in three forms: parental employment, parental role sharing responsibilities, and perceptions of parental work-family interference. Parental employment refers to whether participants parents were employed full-time, part-time or unemployed during various stages of their careers. Perceptions of parental work-family interference refer to whether participants perceived their parents work interfering with their family or vice versa. Parental role sharing responsibilities is the distribution of work between mother, father or both. A self-report questionnaire was distributed to students at a tertiary institution in South Africa. The data was then recorded and analysed using IBM SPSS Statistics (Version 26). The correlational analysis showed that parental employment and anticipated work-family role planning did not correlate with AWFC. Thus it was expected that both variables would not be predictors of AWFC. The hierarchical regression analysis showed that perceptions of parental work-family interference and core self-evaluations were significant predictors of anticipated work-family conflict. The ANOVA analysis showed no statistically significant differences in anticipated work-family conflict across the categories of maternal employment, paternal employment and parental role sharing responsibilities among STEM students ($N = 388$). The implications of these findings are discussed, as well as limitations and recommendations for future research.

Keywords: anticipated work-family conflict; parental employment; core self-evaluations; parental role sharing responsibilities; STEM students

Table of Contents

Abstract	2
Abbreviations	5
STEM students	10
Research Aims.....	11
Research Question.....	11
Literature Review	12
Literature Search Procedure	12
Work-life conflict.....	13
Theoretical approaches to work-family conflict.....	14
Anticipated work-family conflict.....	15
Theoretical approaches to anticipated work-family conflict	18
Forms of Parental Role modelling and Anticipated work-family conflict.....	19
Parental employment	20
Perceptions of parental work-family interference	22
Parental role sharing responsibilities.....	22
Anticipated work-family role planning	24
Personal Characteristic and AWFC.....	25
Core self-evaluations and AWFC.....	25
Research Propositions	26
Method	26
Research Design.....	26
Participants.....	27
Data Collection Procedure	29
Measures.....	29
Anticipated work-family conflict.	29
Perceptions of parental work-family interference.	29
Core self-evaluations.	30
Parental Employment.	30
Parental Role Sharing.	30
Anticipated work-family role planning.	31
Demographic Characteristics	31
Statistical Tools.....	31
Data Cleaning.....	31
Results	32

Anticipated work-family conflict among STEM students

Factor Analysis.....	32
Reliability Analysis	35
Descriptive Statistics	35
Correlational Analysis.....	37
Regression Analysis	37
Perceptions of parental work-family interference and core self-evaluations	38
ANOVA	39
Parental role sharing responsibilities and AWFC.....	39
Maternal employment AWFC	40
Paternal employment and AWFC	40
Discussion.....	41
Contributions of the current study.....	41
Parental role modelling and AWFC	42
Perceptions of parental work-family interference	42
Anticipated work-family role planning	43
Parental Employment	44
Maternal employment.....	45
Paternal employment	46
Parental role sharing responsibilities.....	46
Core self-evaluations.....	47
Limitations	49
Suggestions for future research	50
Implications of the current study.....	51
Conclusion.....	52
References.....	54
Appendices.....	59
Appendix A	59

Abbreviations

AWFC	Anticipated work-family conflict
AWFRP	Anticipated work-family role planning
CSE	Core self-evaluations
PPWFI	Perceptions of parental work-family interference
STEM	Science, Technology, Engineering and Mathematics
WFC	Work-family conflict

Anticipated work-family conflict among STEM students: The role of core self-evaluations and parental role modelling

The transition from late adolescence to early adulthood is a natural process involving many factors, and many adolescents experience difficulty moving through this transition (Mary, 2014). Adolescence refers to a stage in life in which plans and goals for the future come to the forefront. Aspirations for education, occupation and family activities are vital aspects of these future orientations (Johnson, Oesterle & Mortimer, 2001; Cinamon, 2010). Adolescents, as emerging adults, spend this transition exploring career opportunities and relationships regarding future family aspirations (De Andrade, Ferraz, de Oliveira & Hatfield, 2019). Thinking of one's future work and family roles can initiate many concerns among emerging adults, especially those who intend to pursue demanding careers in Science, Technology, Engineering and Mathematics (STEM) industry. This phenomenon is experienced globally, and South African students are not excluded from this. Anticipated work-family conflict (AWFC) is the conflict students expect to experience once they are fully integrated into their future work and family roles (Cinamon, 2008). AWFC has recently received attention by many researchers due to the potential influence it has on student's decision-making process (Barnett, Gareis, James & Steele, 2003; Cinamon, 2010; Coyle, Van Leer & Schroeder & Fulcher, 2015; Weer, Colakoglu & Foley, 2006; Westring & Ryan, 2011). Over the years, there has been a steady increase in careers within the STEM industry (Rozek Svoboda, Harackiewicz, Hulleman & Hyde, 2016). However, many students are not prepared to take advantage of these careers due to this industry's demanding nature. The nature of this industry is characterised by long working hours, limited autonomy and intense work devotion (Minnotte & Pedersen, 2019). By increasing the number of students qualified to pursue careers in the STEM industry, South Africa can improve the economy with increased innovation and technology. Therefore, according to Rozek et al. (2016), STEM students must meet these demands.

Anticipated work-family conflict is "the belief that participation in one's future work-role will interfere with participation in one's future family role and vice versa" (Westring & Ryan p. 597). The interference between work and family is commonly known as work-family conflict, a well-known and well-researched construct experienced by adults (Buonocore, Russo & Ferrara, 2015; Bennette, Beehr & Ivanitskaya, 2017; Cinamon, Weisel & Tuk, 2007). In relation to anticipated work-family conflict, this refers to the extent of work-family conflict young adults anticipate experiencing once they have transitioned into their work and family roles. These expectations have the ability to affect the decisions that individuals make regarding their future, especially individuals within the STEM industry, due to its demanding

nature (Minnotte & Pedersen, 2019). According to Tan-Wilson and Stamp (2015), students who anticipate experiencing higher levels of work-family conflict in their career choice may select a less demanding career path regardless of their capabilities being well-suited to their initial career choice.

All students do not experience the same level of AWFC (Barnett et al., 2003; Coyle, Van Leer, Schroeder & Fulcher, 2015). There is a limited amount of research that identifies the key contributing factors to students anticipated work-family conflict. The factors that have been identified are gender (Cinamon, 2006; van Tongeren-Alers, 2013), self-efficacy to manage anticipated work-family conflict (Westring & Ryan, 2011; Bagraim & Harrison, 2013), core self-evaluation (Westring & Ryan, 2011) and parental role sharing of responsibilities (Cinamon, 2006). Parents' influence on their children's perceptions of work and family has also been consistent within the literature. Parents can influence their children's perceptions of work-family conflict as socialization into this sphere begins from early childhood until adolescence. The behaviour parents display impacts their children's views of work and family, which are vital to their future attitudes and behaviour (Loftus & Droser, 2020). Therefore, parents are seen as the primary source of learning for their children. Parental role modelling is thus an essential phenomenon in understanding how it may influence students anticipated work-family conflict.

There have been tremendous shifts in gender role expectations (Askari et al., 2010). However, many families are still bound by the traditional-gendered norm where the mother is considered the primary caregiver and the father, the primary breadwinner (Fulcher, Dinella & Weisgram, 2015; Goldberg, 2013; Zuo & Tang, 2000). This is seen as a point of interest as young individuals often expect, if not the same, a similar family model of responsibilities as their parents displayed (Cinamon, 2006; Fulcher et al., 2015). This phenomenon can be explained using the Social Learning Theory, which proposes that children learn from their parents through role modelling (Bandura, 1977). Furthermore, the Social Learning Theory also suggests that daughters are more likely to learn from their mothers, and sons are more likely to learn from their fathers (Bandura, 1997). However, today's parents were raised during a time where traditional gender role models were considered the norm (Swartz, 2017). While the shift in attitudes towards sharing work and family roles continues, there is a discrepancy between these attitudes and how they evolve (Askari et al., 2010). Children who grew up with their parents functioning in a traditional-gendered household may expect the same role sharing model within their family regardless of having a dual-earner family (Swartz, 2017). Therefore,

women viewing their family as their primary responsibility are more likely to experience higher anticipated work-family conflict than their male counterparts. Moreover, within a South African context, the nuclear family is not considered the norm. Single-parent families consisting of mothers only are more prevalent (Budlender & Lund, 2011). Therefore, both the family and work roles fall on the mother, contributing to the higher anticipated work-family conflict experienced.

Parental employment affects children's development and educational attainment (Lindeboom, Llena-Nozal & van Der Klaaiw, 2009). Parental employment refers to whether each parent was employed during different stages of their child's life. Children observe and learn about their parents' careers as they grow up by observing their work-related behaviours (Levine & Hoffner, 2006). These behaviours include parents voicing their frustrations concerning work or discussing their accomplishments. These types of conversations and behaviours can shape children's perceptions of work and the type of work they intend to pursue and, in turn, the conflict they anticipate experiencing. Mothers have a more substantial influence on their children's career decisions and aspirations (Weer et al., 2006). Therefore if children observe their mother struggling with managing their work and family roles, they are more likely to anticipate higher levels of work-family conflict once they fulfil their family and work roles.

Core self-evaluations are personality characteristics representing an individual's subconscious evaluations about themselves and their abilities (Westring & Ryan, 2011). CSE is proposed to be the most important evaluation individuals hold regarding themselves, reflecting the foundation upon which they appraise other beliefs (Chang et al., 2012). This means that if individuals view themselves and their abilities in a positive manner, it has the potential to spill over into the appraisals they make concerning AWFC.

The combination of work and life domains has gone through significant changes over the years. Individuals across gender types face many challenges that create an imbalance that often creates conflict between work and family life (Naithani, 2009; Cinamon, 2006; Perrigino et al., 2018). This level of conflict influences the individual's working ability and performance and directly impacts the individual's personal life (Naithani, 2009; Perrigino et al., 2018). Organisations strive for high productivity and require their workforce to be more engaged with their work responsibilities to meet the organisation's demands and pressure (Naithani, 2009; Perrigino et al., 2018). As the level of work increases, employees must be able to balance their

work and family roles (Soni & Sharma, 2014). This is important as it will contribute to the individual's quality of life, thereby enabling individuals to contribute more meaningfully towards organisational growth and success.

Work and family conflict have always been a topic of interest for researchers and organisations due to the extreme demographic landscape changes (Greenhaus & Parasuraman, 1999; Perrigino et al., 2018). This includes more women entering the workforce, the decline of traditional gender roles, the increase in dual-earning couples and single working parents and the evolving egalitarian family structures that have exerted pressure on individuals to balance work and family domains. Moreover, the advancement in technology has led to the emergence of constant connectivity and increased globalised business trading, which has further impacted and has made the concept of work-family conflict (WFC) an interesting topic (Soni & Sharma, 2014). Flexible working hours and remote working have enabled individuals to work from different locations, particularly from home, which further challenges the ability to manage work and family roles (Potgieter & Barnard, 2010). Additionally, the increase in pressure to provide for a family and have a fulfilling career becomes a challenge for both genders who currently fulfil work and family roles (Westring & Ryan, 2011; Greer & Egan 2012). In addition, women entering the job market have increased considerably in progressive societies instead of men adopting increased involvement in childcare activities. This is supported by Cinamon and Rich (2002), who stated that women with demanding careers continue to invest more time in family responsibilities and activities than their male counterparts.

WFC is important to the individual and organisations as organisations need to be aware of this phenomenon to make provision for the impacts that this would have on the organisation. This is important to note as university students will soon enter the workforce, become spouses, parents and business leaders. Therefore, it is important to understand students' expectations of WFC and how it will impact occupational choices and how they prioritise work and family roles. Therefore, organisations need to understand what these students expect in terms of WFC to prepare for and attract the most suitable employees.

In previously conducted vocational research, two broad areas have been investigated 1) career development and 2) WFC (Westring & Ryan, 2011). However, there is not much known about how WFC may influence the career development process (Barnett, Gareis, James & Steele, 2003). Barnett et al. (2003) further stated that most of the literature focuses on students' plans regarding their choice of career and course of study. According to Cinamon (2006),

young adults' plan manifests anticipated active participation in work and family roles. The increase in supporting family and managing a career are challenges that young adults need to face, influencing their expectations around future life roles. Therefore, most young adults dedicate their formative years to education and relationships to prepare for future life roles (Cinamon, 2010). However, the decision about the future can induce concerns, especially for students who are planning to pursue demanding careers and the impact that it will have on their family life. It is for this reason that anticipated work-family conflict (AWFC) amongst students has developed interest among researchers due to the impact it can have on student's decision making around work and family life choices (Barnett et al., 2003; Michael, Most, & Cinamon, 2011; Westring & Ryan, 2011).

STEM students

Work-family issues are pervasive within the STEM industry. Individuals employed in this industry have some sort of autonomy. However, the demands of the job are open-ended and work devotion is intense, resulting in STEM employees experiencing conflict (Minnotte & Pedersen, 2019). The conflict is often amplified within the STEM industry as these individuals are often expected to devote themselves to their work without interference from their family life (Fox, Fonseca & Bao, 2011; Minnotte & Pedersen, 2019). This is further amplified by a work culture that sees long work hours as a need to succeed (Fox et al., 2011). It is thus important that these individuals are able to balance work and family roles, as it is integral to these individuals' wellbeing. Research has found that work-life conflict negatively impacts these individuals and results in reduced job satisfaction, organisational commitment, and higher turnover intentions (Talukder, 2019). Consequently, these outcomes extend to lower family, marriage and overall life satisfaction (Allen & Martin, 2017). The link between work-family conflict and lower organisational commitment is imperative as it is important to retain these STEM employees to ensure a strong workforce that can effectively contribute to an important industry.

In a study done by Buschor, Kappler, Frei and Berweger (2014) utilising undergraduates in the Science, Technology, Engineering and Mathematics (STEM) field, the authors found that women did not express clear or specific career goals apart from vague ideas of becoming a scientist. This could be interpreted in various ways. Firstly, Buschor et al. (2014) state that the vagueness and uncertainty of the student's plans could indicate that they were considering starting a family, which could influence women's career plans from the beginning

of their studies. Secondly, the undergraduate students did not have proper role models within this sample, which could have contributed to their vague idea of working in the science field.

University students have a greater capacity to act and reflect on their future plans, which is crucial for developing their career and family aspirations (Tan-Wilson & Stamp, 2015). In their study, Tan-Wilson and Stamp (2015) highlighted that the college students in their sample belong to the Millennial generation, who value work-life balance more than previous generations. Furthermore, Millennials have the opportunity to address work-life balance in relation to their career decision while they are studying. This is because the traditional student is not married and does not have any children (Tan-Wilson and Stamp (2015). There is, therefore, a high possibility that the student's perception of work-life conflict may be overlooked in their career decision. The STEM industry plays a key role in growing and sustaining the economy. Therefore, it is important to understand how these individuals anticipate experiencing work-family conflict so that appropriate measures can be implemented to ensure they follow through with their chosen field within the STEM industry. More importantly, it will grow and sustain the STEM workforce to contribute to the industry effectively.

Research Aims

The aim of this study is to examine the impact of three forms of parental role modelling, namely 1) parental employment, 2) parental role sharing responsibilities, and 3) parental work-family interference on STEM students anticipated work-family conflict. The study also aimed to explore the impact of STEM students' core self-evaluations on anticipated work-family conflict. Additionally, this study examined whether students planning for their future work and family roles impacted their anticipated work-family conflict. The current study used a sample of students studying towards a degree within the STEM industry from a well-known tertiary education institution.

Research Question

What are the effects of parental role modelling and core self-evaluations on STEM students AWFC? More explicitly, to what extent do parental employment, perceived parental work-family interference, parental role sharing responsibilities, anticipated work-family role planning, and core self-evaluations affect STEM students anticipated work-family conflict?

Literature Review

Literature Search Procedure

Although there is plenty of research regarding work-family conflict, there is little research regarding anticipated work-family conflict. More so, limited research is presented regarding the anticipated work-family conflict of STEM students. Numerous electronic databases were used to find relevant journal articles pertaining to the study. The electronic databases consulted included Google Scholar PsychInfo, Jstor, Emerald and Science Direct. The area of anticipated work-family conflict is a relatively new area of study. Therefore, numerous searches were conducted to source journal articles that examined anticipated work-family conflict and related constructs. The search terms that were utilized included “anticipated”, “expected”, “future”, “work”, “career”, “family”, “conflict”, “core self-evaluations”, “parental employment”, “maternal employment” “paternal employment” “parental role sharing responsibilities”, “traditional”, “egalitarian”, “STEM”, “university”, and “college”.

The searchers revealed a number of journal articles regarding anticipated work-family conflict. However, not (add how many articles) many articles regarding anticipated work-family conflict and the variables under study (see Table 1 below). Therefore, “work-family conflict” was used as a search term to better understand the theoretical basis of anticipated work-family conflict.

STEM Industry

STEM careers are seen as catalysts of economic growth, expansion and remain at the centre of innovation (Waite & McDonald, 2019). This industry specifically is expected to undergo shifts as we move through the Fourth Industrial Revolution, mainly driven by research and development in artificial intelligence, machine learning and robotics etc. (Waite & McDonald, 2019). Therefore the need for STEM careers will continue to rise and overtake careers that are not within the STEM industry. The STEM industry can be quite demanding as it sees long working hours as a means of success. Furthermore, careers in this industry have been stereotyped as less family-friendly and do not have much time for individuals to participate in other roles actively. Regardless of the importance and high labour compensation for students majoring in STEM fields, there is still a short supply of students moving into STEM careers once they have completed their tertiary education (Waite & McDonald, 2019).

Tan-Wilson and Stamp (2015) found that students thought work-life balance is more difficult to achieve in STEM careers than in other professions. Their concerns were that they would not fulfil their family roles while developing their career within the STEM industry. Therefore, the ability to balance both work and family life was important to the students under study. The authors explained that the millennial generation and generations to follow would be the largest cohort size and the most educated (Tan-Wilson & Stamp, 2015). Therefore these students are a part of the most important source of individuals for careers within the STEM industry. The authors concluded that faculty members should be aware that students associated careers in the STEM field with poor work-life balance, which could be seen as a barrier to students pursuing these careers.

The STEM industry is constantly changing as many area's of expertise in high demand did not exist a few years ago (Heilbrunner, 2011; Dasgupta & Stout, 2014). The constant advances in technology that powers the majority of the STEM disciplines mean that students should always keep up with industry trends (Tan-Wilspn & Stamp, 2015). If they do not, their education may become obsolete. Students are expected to do this on top of managing their complex and intense STEM courses and majors. This can become extremely overwhelming, and students may lose interest and drop out or change their courses due to the rigorous and demanding nature of their courses within the STEM field (Waite & McDonald, 2019). Students may not do well on a test or assignment and could struggle over a long period, they could eventually achieve success or they could not (Heilbrunner, 2011). The students who do not achieve success may drop out as success did not come quickly, the goal was not worth pursuing, or they believed they were not talented enough (Heilbrunner, 2011).

Work-life conflict

Work-family conflict is a well-researched concept amongst working adults (Cinamon, Weisel & Tzuk, 2007; Westring & Ryan, 2011). "Work-family conflict occurs when an individual encounter demands associated with one domain that is incompatible with demands associated with the other domain" (Cinamon and Rich, 2002 p 531). This means that when an individual experiences incompatible demands between two closely related domains such as work and family, it causes difficulty with participation in both work and family roles. This imbalance can then cause conflict within the work-family interface. The presence of conflict within the family sphere has been associated with lower levels of satisfaction with life and relationships resulting in insufficient dedication to children's education (De Andrade, Ferraz,

de Oliveira & Hatfield, 2019). It may also lead to a decrease in physical and psychological health.

On the other hand, when conflict is experienced in the work domain, it results in poor worker performance (De Andrade et al., 2019). Greenhouse and Beutell (1985) proposed that the more important the specific role is to an individual, the more time and energy will be invested. Consequently, there will be less time and energy for other roles. For example, suppose an individual invests a lot of time and energy into their work roles. In that case, their family responsibilities will suffer and vice versa. Thus, it is essential to understand work-family conflict as it will be used as a reference point to understand anticipated work-family conflict.

Theoretical approaches to work-family conflict

Many theories are used to explain the phenomena of work-family conflict. These theories will provide a theoretical basis for understanding anticipated work-family conflict. The underlying dynamics that could be at play when STEM students think about and experience anticipated work-family conflict could be a lack of individual resources and the constant transitioning between their university and family life. The Role Strain Theory (Goode, 1960) and the Conservation of Resources Theory (Hobfoll, 1989) will be discussed.

Role Strain Theory

The Role Strain theory's premise is that institutions consist of various role relationships and approaches social action and structure through role strain (Goode, 1960). According to Goode (1960, p. 483), role strain is defined as “the felt difficulty in fulfilling role obligations”. This means that we participate in different role relationships (i.e. mother, father, daughter or employee, etc.) that require us to perform various duties and responsibilities. When fulfilling duties in one role relationship, it can lessen our ability to fulfil duties in other role relationships due to limited personal resources. Suppose too much time is spent fulfilling the duties in one role (i.e. employee). In that case, there will be less time available to fulfil the duties in other roles (i.e. mother). This will result in the individual experiencing work-family conflict.

Conservation of Resources Theory

The Conservation of Resources theory provides a basis for understanding the processes involved with experiencing and coping with stress (Hobfoll, 1989). Moreover, the Conservation of Resources Theory also emphasises the importance of resources in managing stress (Hobfoll, 1989). Time is seen as a valuable resource to individuals as it can be divided between various role relationships. Suppose individuals do not divide the time equally between

their role relationships. In that case, this will be seen as a threat leading to individuals experiencing stress (Hobfoll, 1989). In the context of this study, the stress experienced would be work-family conflict.

When combining these two theories to better understand the concept of work-family, we can see that individuals who actively participate in both work and family roles often experience role overload, which can occur in both work and family roles (Goode, 1960). During this occurrence, individuals often transfer resources to the overloaded role due to the limited personal resources (i.e. time) available (Hobfoll, 1989). For example, a mother has to put in extra hours at work due to a pending deadline. Therefore, the work role leads to resources such as time and attention from her family role being taken away (Matthews, Winkel & Wayne, 2014).

Anticipated work-family conflict

Anticipated work-family conflict is an extension of work-family conflict as it views work-family conflict from an expected perspective. The experiences of anticipated work-family conflict are relevant to individuals who are transitioning from late adolescence to early adulthood. Young individuals spend their time thinking through their plans regarding their work and family roles and the potential stressors that come along with it. According to Tan-Wilson and Stamp (2015), the thoughts evoked through this transition have the ability to influence the type of degree an individual pursues. Additionally, thoughts regarding whether marriage and children are part of the individual's life come to the forefront (Weer et al., 2006; Barnett et al., 2003).

Researchers have begun to show interest in further understanding anticipated work-family conflict (Cinamon, 2010; Cinamon & Rich, 2014; Coyle et al., 2015; Bagraim & Harrison, 2013; Weer et al., 2006). Table 1 summarises all the articles that have examined the concept of anticipated work-family conflict and related constructs.

Anticipated work-family conflict among STEM students

Table 1

Summary Table of Studies Examining Anticipated Work-Family Conflict (AWFC) and Variables understudy

Author/s	Variables	Findings
Barnett et al. (2003)	CMC Maternal Employment	Students expressed less CMC when their mothers worked during childhood years Mother's early work history was a stronger predictor of CMC
Bagraim & Harrison (2013)	AWFC Maternal Employment Paternal Employment	AWFC is unidimensional Female students experienced less AWFC if their mothers worked full time Paternal employment does not predict AWFC
Bush et al; (2011)	Career-family conflict Career-marriage conflict	Female students did not anticipate experiencing career-family conflict or career-marriage conflict
Basuil & Casper (2012)	Perceptions of parents WFC	Perceptions of participants parents WFC was positively related to their AWFC
Cinamon (2006)	Parental sharing of family responsibilities	Students exposed to an egalitarian model of sharing childcare responsibilities anticipated lower levels of work-family conflict
Cinamon (2010)	AWFC	Only examined AWFC
Coyle et al. 2015	AWFC	Women anticipated more AWFC than men
Gaffey & Rottinghaus (2009)	AWFC Gender	There was no significant gender difference found for AWFC
Michael, Most & Cinamon (2013)	AWFC	Only examined AWFC

Anticipated work-family conflict among STEM students

Weer et al. (2006)	EWFC Maternal employment	Maternal employment was not a predictor of EWFC Women expected high levels of EWFC regardless of the extensiveness of maternal employment
Westring & Ryan (2011)	AWFC CSE	CSE was found to be a significant predictor of AWFC
Wright et al. (2019)	AWFC	Family influences did not affect college student's AWFC

Notes: CMC = career-marriage conflict; AWFC = anticipated work-family conflict; EWE = expected work-family conflict; CSE = core self-evaluations

Theoretical approaches to anticipated work-family conflict

The following section discusses Social Learning Theory (Bandura, 1971) and Super's life-span life-space theory (Super, 1980). These theories have been used as a basis to understand the concept of anticipated work-family conflict.

Social Learning theory

Research suggests that socialisation into the work-family interface begins from early childhood and continues throughout adolescence (Wiese & Freund, 2011). Levine and Hoffner (2006) stated that socialisation occurs through many sources. However, parents are the primary and most influential learning sources for their children (Levine & Hoffner, 2006). This process continues into young adulthood. This phenomenon is grounded in the Social Learning theory, which states that learning takes place best through role modelling (Bandura, 1977). This means that children learn best from observing the behaviours displayed by their parents or caregivers. In the context of this study, the theory suggests that children observe their parent's behaviours in both their work and family domains, internalise these behaviours and act out accordingly.

Learning is a continuous process that can change based on the positive or negative reinforcement of behaviour. For example, a daughter observes her mother focusing on her career and working, creating tension and conflict between her parents (Swartz, 2017). This is seen as a negative outcome, and the daughter would then be less likely to imitate her mother's work and family roles. Through their daily experiences at home and school, young individuals learn about specific occupations regarding prestige, social status and educational requirements (Levine & Hoffner, 2006). According to Bandura (1977), social learning theory recognises that learning outcomes can change in different situations and that learning is a continuous process. The majority of studies have explored the effect of parent's behaviour on their student's decisions regarding their work and family roles within the future (Basuil & Casper, 2012; O'Shea & Kirrane, 2008; Loftus & Droser, 2020)

Super's life-span life-space theory

Super's life-span, life-space theory (1980), is based on the premise that individuals go through nine different roles within their lives. These roles are 1) child (son or daughter) 2) student 3) leisurite – an individual who pursues leisure activities 4) citizen 5) worker 6) spouse 7) homemaker 8) parent and 9) pensioner (Super, 1980). An individual occupies a single role during the earlier stages of their life (child) and moves into occupying various roles during the

other stages of their life (worker, spouse). This is where the blurring of boundaries come into play as the more roles an individual occupies, the less time and attention they have to give the other roles they occupy.

Applying Super's theory to anticipated work-family conflict, an individual has only occupied a child and student's role until adolescence. However, as these individuals move into adulthood, they begin to think about the various roles they will occupy, such as workers, spouse and parent etc. (Hartmann & Swartz, 2006). The anticipation of moving into multiple roles can induce concerns in young adults when thinking about their future. These concerns are viewed as an anticipated work-family conflict. Super's (1980) theory emphasises the multiple roles that an individual fulfils and the transitioning between them.

Forms of Parental Role modelling and Anticipated work-family conflict

Many studies have examined the predictors of anticipated work-family conflict. These include maternal employment (Barnett et al., 2003; Bagraim & Harrison, 2013; Weer et al., 2006), paternal employment (Bagraim & Harrison, 2013), gender (Cinamon, 2006), religious affiliation (Barnett et al., 2003), parental education (Bagraim & Harrison, 2013), core self-evaluations (Westring & Ryan, 2011) and role salience. However, no study has examined the effect of three forms of parental role modelling on STEM students anticipated work-family conflict. Parents play a vital role in shaping children's views regarding the work and family domains. Socialisation into these domains occurs from early childhood to beyond adolescence (Wiese & Freund, 2011). Parents' behaviour is imperative as it may impact their young children's perception of work and family (Loftus & Droser, 2020). These perceptions are imperative for the child's future attitudes and behaviours (Loftus & Droser, 2020). Parents are, therefore, seen as the primary source of learning for their children. Therefore, this study focused on the influence of parental role modelling to determine the predictors of anticipated work-family conflict.

It is important to note that many households in South Africa are not made up of a nuclear family (i.e. a mother and a father) as many children do not live with their biological parents (Budlender & Lund, 2011). Grandparents also play a significant role in raising children, which is also important to note (Budlender & Lund, 2011). Within a South African context, role models are not limited to the biological mother and father, which could also influence how WFC is portrayed. Adolescents' attitudes regarding combining work and family roles are influenced by their role models (i.e. parents and caregivers) (Basiul & Casper, 2012; Zahedani,

Rezaee, Yazdani, Bagheri, & Nabeiei, 2016). Adolescents observe these role models and their ability to manage the work and family interface's positive and negative aspects as they grow up (Basiul & Casper, 2012). The following section will discuss the three forms of parental role modelling examined in this study: parental employment, perceptions of parental work-family interference, and parental role sharing responsibilities.

Parental employment

Parental employment refers to whether parents were employed full-time, part-time, or not employed during various stages of their careers. Employment patterns may be influenced by internal (i.e. the birth of a child) or external factors (i.e. retrenchment). Parental employment impacts the early development years of a child and can potentially affect the child's functioning. Studies have found that parental employment could affect their child's development and educational attainment (Lindeboom et al., 2009). Young individuals learn about their parents' careers by observing their parents in work-related activities or hearing parents speak about their jobs (Levine & Hoffner, 2006). Parents may voice negative aspects of their work during these discussions, such as conflict or talking about their work accomplishments. These types of conversations can shape their children's perception of work. Regardless of the rise in interest in the effects of parental employment, the results have been inconclusive. Further research is therefore required to understand the influence of parental employment on children's functioning.

Women are continually socialized into believing that being a wife and fulfilling family responsibilities should be their first and most important priority, and their career development and financial independence should be secondary (Cinamon, 2006). Wiese and Freund (2011) stated that children who grow up in an industrialized Western society experience mixed-gender role signals. Children are more likely to experience a traditional gender role division whereby their mother performs family responsibilities such as housework and childcare, even though their mothers are employed full-time (Wiese & Freund, 2011). Concurrently, politics and media reinforce an egalitarian view of men and women working and raising children (Wiese & Freund, 2011). The impact of being exposed to mixed-gender role signals can potentially influence children's anticipated work-family conflict. Wiese and Freund (2011) conducted a study to investigate parental work on adolescents' future working plans. This study confirmed that same-gendered parents served as main role models for the adolescents' future career plans.

In contrast, opposite-gender parents served as models for the adolescents' future life partner's preferred expectation.

In addition, women entering the job market have increased considerably in progressive societies instead of men adopting increased involvement in childcare activities. According to Fernandez-Cornejo et al. (2016) and Wiese and Freund (2011), this significant progress should be aligned with parallel progress that incorporates men into domestic work and childcare, which is not always the case. This will lead to working women experiencing higher levels of conflict associated with their work and family roles than working men. Moreover, this disparity is likely to suggest a great sense of dual responsibility leading to more significant conflicts associated with work and family roles (Wiese & Freund, 2011). A mother's career seems to be more affected when a child is born than the father (Barnett et al., 2003; Weer et al., 2006). Cinamon & Rich (2002) stated that women with demanding careers still invest more time and effort in their family activities than their male counterparts.

Not many studies have examined the impact of maternal employment on students' anticipated work-family conflict (Bagram & Harrison, 2013; Barnett et al. 2003, Weer et al., 2006). In a study by Barnett et al. (2003), the relationship between maternal employment and anticipated career-marriage conflict was examined. This is a similar concept to anticipated work-family conflict. The study results revealed that participants whose mother was employed during their childhood experienced lower levels of anticipated career-marriage conflict (Barnett et al., 2003). Furthermore, Barnett et al. (2003) explained that students who observed their mothers working while growing up would expect to be working mothers or expect to be married to a working mother. Contrary to this, Weer et al. (2006) found that a female student's anticipated work-family conflict was unrelated to their mother's employment. Moreover, female students expected higher levels of anticipated work-family conflict, even if their mother did not work (Weer et al., 2006).

Paternal employment has received little attention in the anticipated work-family contact sphere. Men continue to be seen as the primary source of income within the family and work until their child's adolescent years (Swartz, 2017). In congruence with the social learning theory, paternal employment was included in the current study to determine whether maternal employment impacts STEM students anticipated work-family conflict.

Perceptions of parental work-family interference

Perceptions of parental work-family interference refer to whether young adults perceived their parents work interfering with their family or vice versa. As previously discussed, children observe the behaviours of their parents as they grow up. These children watch their parents' involvement in the work and family domains and whether their parents' work interfered with their family and vice versa.

Perceived work to family conflict of mothers and fathers, a similar variable to perceptions of parental work-family interference, was examined by Basuil and Casper (2012). The authors proposed that due to students not having families of their own or experiencing working life, they make assumptions and base their expectations on their parents' behaviour (Basuil & Casper, 2012). The results revealed that perceived work to family conflict of parents is linked to work-family role planning. When individuals are exposed to particular behaviours growing up, they become familiar with them through observation, influencing their decision-making process. For example, suppose a child grew up observing their parents work continually interfering with their family life. In that case, it can influence their choices regarding the occupation they pursue or whether they intend to have a family of their own. These findings have shown the importance of an individual's perception of their parent's behaviour and its significance within the work-family domains. It is therefore expected that perceptions of parental work-family interference would predict anticipated work-family conflict.

Parental role sharing responsibilities

Parental sharing of responsibilities refers to the distribution of work between the student's mother, father or both (Cinamon, 2006). According to Budlender and Lund (2011), many households in South Africa are not made up of two parents and their children, as many children do not live with their biological parents. Grandparents also play a significant role in raising children, which is also important to note (Budlender & Lund, 2011). Within a South African context, role models are therefore not limited to the biological mother and father, which could also influence how work-family conflict is portrayed. Adolescents' attitudes regarding combining work and family roles are influenced by their role models (i.e. parents and caregivers) (Basiul & Casper, 2012). Adolescents observe these role models and their ability to manage the work and family interface's positive and negative aspects as they grow up (Basiul & Casper, 2012).

Basiul and Casper (2012) utilized the social learning theory (SLT) to establish how parental work-family conflict relates to adolescents' planning attitudes toward work and family roles. SLT helps to understand the process of gendered socialization (Wiese & Freund, 2011). A key aspect of the SLT is second-hand learning or modelling by which social learning occurs through intentional or unintentional learning through observation of the role models and the consequences thereof (Basiul & Casper, 2012; Wiese & Freund, 2011). This could increase the learning speed of the adolescent and form expectations of work and family roles. This is supported by Barnett, Gareis, James and Steele (2003), who stated that individuals' parents' experiences might contribute to their perceptions of AWFC. For example, adolescents who perceive their parents as effectively balancing their work and family roles might assume that no preparation is needed. The implications of this are that the adolescent will not plan for AWFC. Conversely, adolescents that observe high conflict could become more committed to future work-family planning.

According to Basiul and Casper (2012) and Wiese and Freund (2011), adolescents view same-gender parents as role models instead of opposite-gender parents. This means that a mother's experience of work-family conflict relates more to her daughter's attitudes towards AWFC. In contrast, the son would relate more to the father. The Social learning theory infers that same-gender parent behaviour influences adolescents' perspectives more than that of the opposite-gender parent (Basiul & Casper, 2012). Bandura (1977) states that Social learning theory suggests that individuals choose role models based on the individual's interpersonal attraction, which is often similar. Bandura (1977) further concludes that when the adolescent's role model shares the same gender as the observer, it speeds up the learning because the role model's behaviour is viewed close to the individual's capabilities. Therefore, when the daughter's mother has a high work-to-family conflict, the daughter may anticipate challenges managing work and family and be inclined to prepare through acquiring knowledge. Similarly, this would exist for a father-son relationship. Basiul & Casper (2012) also states that because family responsibilities are seen as traditionally women's work, sons who experience their mother's effectively managing work and family roles will assume that their future wives will do likewise.

Beigi, Wang, Arthur (2017) conducted a study on the work-family interface concerning career success. The authors found that both male and female participants would not achieve career success if they did not receive support from their spouses. Furthermore, the consistent support

in the form of childcare and household responsibilities from the participants' spouses encouraged them to invest in their careers. The sharing of responsibilities was a substantial contributing factor in combining work and family responsibilities, thereby managing the two roles' conflict (Beigi et al., 2017).

Anticipated work-family role planning

Anticipated work-family role planning refers to whether individuals aim to employ strategies to assist with balancing their work and family roles in the future. An example of a strategy could be to speak to others who are also experiencing work-family conflict to understand how they are navigating through the conflict between the two roles. These individuals would then employ these strategies to determine whether they are effective or not. Anticipated work-family role planning could be viewed as an outcome of anticipated work-family conflict. Suppose an individual anticipates experiencing high levels of work-family conflict in their future roles. In that case, they may anticipate planning to ensure they are able to manage the conflict between the two roles effectively. No study to date has examined the effect of anticipated work-family role planning on anticipated work-family conflict within a South African context.

Bausil and Casper (2012) have investigated the concept of anticipated work-family role planning using Bandura's (1971) social learning theory. The authors suggested that the students' perceptions of their parental role models work-family conflict will influence their work-family role planning in the future. This could often be an important oversight as planning during emerging adulthood can better facilitate work-family management when individuals are fully immersed in their future work and family roles (Basuil & Casper, 2012). Due to young adults being less likely to have their spouses and children, it is expected that their perceptions of their future work and family roles are based on the observations of their parents. These observations may then influence their perceptions of anticipated work-family conflict (Barnett et al., 2003). For example, students who observed their parents experiencing high levels of work-family conflict may be more involved in gaining knowledge and preparing for their future work-family conflict to prevent the conflict their parents experienced. On the other hand, students who have observed their parents experiencing less work-family conflict may assume that preparation for these future roles is unnecessary.

Planning ahead is important for self-regulation and may help individuals effectively navigate the difficulties of work-family conflict. When individuals plan, they shift from having

intentions of drawing up an action plan to help them achieve their goals (Parke et al., 2018). Suppose young adults anticipate planning for their future work-family conflict. In that case, they will know how to handle the conflict between these two roles, effectively balancing work-family conflict. Young adults who plan for their future work and family roles may experience lower work-family conflict compared to those who do not plan (Barnett et al., 2003; Peak & Harris, 2002). Therefore, it can be assumed that if individuals anticipate planning how to manage the conflict that arises between the work and family domains, they will not anticipate work-family conflict in their future roles.

Personal Characteristic and AWFC

Several studies have examined the effect of personal characteristics on students anticipated work-family conflict. (Bagraim & Harrison, 2013; Cinamon, 2006; Michael et al., 2011; Westring and Ryan, 2011; De Andrade, Ferraz, Oliverira & Hatfield, 2019). The current study examined the effects of core self-evaluations on STEM students anticipated work-family conflict.

Core self-evaluations and AWFC

Core self-evaluation (CSE) is a personality factor that will be examined in this study. CSE represents an individual's subconscious evaluations about themselves, their abilities and self-worth (Westring & Ryan, 2011; Chang et al., 2012). CSE encompasses four sub-components: self-esteem, self-efficacy, locus of control, and neuroticism (Westring & Ryan, 2011; Stumpp et al., 2010; Haines et al., 2013). CSE is proposed to be the most valuable evaluation individuals hold, reflecting the foundation upon which individuals appraise other beliefs and evaluations (Chang et al., 2012). Thus, if students positively view themselves, it could spill over into the positive appraisals they make regarding AWFC.

According to Judge et al. (2003), positive CSE influences the outcomes of stressful situations as it positively influences the thought processes and appraisals made by individuals regarding different aspects (Chang et al., 2012). Chang et al. (2012) stated that individuals with positive CSE are associated with approaching challenging tasks instead of avoiding them. Moreover, individuals evaluate situations and adopt an approach that will result in a positive outcome (Chang et al., 2012). This may result in individuals exerting control over their work and family roles. It has been found that individuals with positive CSE experience less WFC (Boyar & Moseley, 2007; Haines et al., 2013). By extension, students with positive CSE are more likely to anticipate less work-family conflict. Westring and Ryan (2011) also found CSE

to be a predictor of AWFC amongst medical students. CSE influences approach and avoidance outcomes. Judge et al. (2003) provided four processes whereby CSE influences outcomes. First, CSE potentially affects outcomes based on a process of emotional generalization whereby positive self-views spill into and influence other outcomes (Judge et al., 2003). Second, CSE could indirectly affect outcomes by influencing cognitions individuals hold and making appraisals regarding different attributes such as job characteristics (Judge et al., 2003). Third, CSE may influence outcomes through influencing actions individuals engage in, such as persisting with a challenging task (Judge et al., 1997). Last, CSE could moderate the relationship between variables whereby reactions are influenced by how one values or finds themselves worthy (Judge et al., 2003). Therefore, positive CSE could assist students in managing the demands of work and family in the future. The strong positive belief about themselves and their ability to succeed could buffer the effects of WFC in their future roles.

Research Propositions

- Proposition 1:** Perceptions of parental work-family interference significantly explains the variance in anticipated work-family conflict.
- Proposition 2:** Anticipated work-family role planning significantly explains the variance in anticipated work-family conflict.
- Proposition 3:** Parental employment significantly explains the variance in anticipated work-family conflict.
- Proposition 4:** Maternal employment significantly explains the variance in anticipated work-family conflict.
- Proposition 5:** Paternal employment significantly explains the variance in anticipated work-family conflict.
- Proposition 6:** Parental role sharing responsibilities significantly explains the variance in anticipated work-family conflict.
- Proposition 7:** Core self-evaluations significantly explains the variance in anticipated work-family conflict.

Method

Research Design

The present study employed a quantitative research approach using a cross-sectional design. A quantitative approach allows for various statistical explorations between the variables of interest (Yilmaz, 2013). While the cross-sectional design was used due to time and resource constraints (Field, 2018). A self-report survey was distributed to provide insights into

the variables of interest. The variables of interest are subjective phenomena; therefore, the best method for measuring these variables is assessing the participants' views of the variables utilising a questionnaire (Field, 2018).

Participants

Initially, 511 STEM students completed the questionnaire. After removing individuals who had not met the required criteria, the sample consisted of ($N = 388$) participants. Participants had to be currently studying towards a degree within the STEM industry to be eligible to participate in the study. Due to this, a purposive sampling method was employed as the researcher deliberately chose participants based on specific characteristics the participant possesses (Etikan, 2015). Given this study's time and resource constraints, this data collection method was deemed most effective.

The mean age among the participants was 21.80 years ($SD = 4.21$). Within the sample, the majority of the housework (67%; $n = 260$) and childcare responsibilities (62.9%; $n = 244$) were completed by the mother figure. 14.9% ($n = 58$) of the participants in the sample reported their parents equally sharing the household work, and 24.7% ($n = 96$) reported their parents equally sharing the childcare responsibilities. Of the sample, 65.5% ($n = 254$) students reported wanting to get married and 63.1% ($n = 245$) reported wanting children in the future. The mean age at which participants wanted to get married was 27 years, and the mean age at which participants wanted their first child was 30 years. The majority of the participants (62.6%; $n = 243$) reported often thinking about combining the demands of their family and work in the future. Interestingly, the majority of the participants reported either speaking to others regarding work-family balance strategies (71%; $n = 276$), trying out different ways (86.8%; $n = 337$) or reading up strategies (63.6%; $n = 247$) regarding balancing work and family roles. Table 2 below provides the distribution of further demographics of the participants.

Table 2

Demographic Characteristics of the Sample

Demographic Characteristic	Category	%	<i>n</i>
Sample	Total sample	100	<i>N</i> = 388
Ethnicity	Black	39.7	154
	Coloured	13.1	51
	White	27.6	107
	Indian	9.5	37
	Asian	.8	3
	Other	2.8	11
Gender	Male	35.8	139
	Female	61.6	239
	Gender variant/Non-conforming	2.1	8
	Prefer not to answer	.5	2
Degree by area of study	Science	38.9	151
	Technology	12.9	50
	Engineering	33	128
	Mathematics	15.2	59
Number of children wanted	One	3.4	23
	Two	28.9	112
	Three	20.1	78
	Four or more	11.3	44
Parental role sharing of housework	Mother figure	67	260
	Father figure	2.8	11
	Equally by both parents	14.9	58
	Other family members	14.9	58
Parental role sharing of childcare	Mother figure	62.9	244
	Father figure	5.9	23
	Equally by both parents	24.7	96
	Other family members	6.4	25

Note % = percentage; *n* = sample subset; *N* = sample size

Data Collection Procedure

Prior to data collection, permission was obtained from the University of Cape Town's Commerce Faculty Ethics in Research Committee. The clearance number for the ethics application was REC 2020/06/011. A self-report, online questionnaire (see Appendix A for a breakdown of the scales used) was created using Qualtrics, a web-based survey tool (Qualtrics, 2020). The questionnaire had a cover letter detailing the purpose of the study and ensured confidentiality and anonymity. The questionnaire did not ask for any personal identifying information, thereby ensuring responses could not be linked to the participant. The cover letter also explained that participation in the study is voluntary, and the participant could withdraw at any time. The questionnaire was then distributed to students at the University of Cape Town.

Measures

Anticipated work-family conflict. AWFC was measured using an adapted version of Gutek, Searles and Klepa's (1991) 8-item measure of work-family conflict. The items on this scale were changed to future tense as it required students to think about their anticipated conflict of future work and family demands. The first four items related to participants anticipated work to family conflict, and the last four items reflected their anticipated family to work to conflict. In this case, the anticipated work family conflict includes both directions, work-family conflict and family-work conflict. Participants were asked to indicate their level of agreement on a 5-point Likert scale (where 1 = *Strongly Disagree* to 5 = *Strongly Agree*), whereby high scores indicated high levels of AWFC, and low scores indicated low levels of AWFC. An example of the anticipated work to family conflict items is "On the job, I will have so much work to do that it will take away from my personal interest. An example of the anticipated work to family items is "My personal demands will be so great that it will take away from my work". In a study conducted by Cinamon (2006), this scale was found to have a high internal consistency with a reliability score of .78 and .80 for anticipated work to family conflict and anticipated family to work conflict, respectively. Participants overall score was calculated by adding their responses together. Total scores could range from 8 to 40, where participants with higher scores anticipated higher levels of work-family conflict.

Perceptions of parental work-family interference. Students perceptions of parental work-family interference were measured using five items adapted from Netemeyer, Boles and McMurrian (1996). This scale aims to measure how parents' work interferes with family life as perceived by adolescents. A sample item of perceptions of parental work-family interface scale is "My parent/guardian had to miss family activities due to the amount of time he/she spent on

work”. This scale consists of a 5-point Likert scale ranging from 1 = “Strongly Disagree” to 5 = “Strongly Agree. Participants' overall score was calculated by summing the responses from 1 to 5. High scores indicated that their parents' work interfered with their family responsibilities. In a previous study, the PPWFI scale indicated a Cronbach's $\alpha = .95$ (Basuil & Casper, 2012).

Core self-evaluations. Participants CSE was measured using the 12-item CSE Scale developed by Judge, Erez, Bono and Thoresen (2003). This scale is used to assess evaluations of self-worth, competencies and capabilities of an individual. Participants were asked to indicate their level of agreement on a 5-point Likert scale (where 1 = *Strongly Disagree* to 5 = *Strongly Agree*) with statements relating to themselves. Participants with higher scores have more positive core self-evaluations about themselves. A sample item of the CSE scale is “I am confident I get the success I deserve in life.”. This scale reported a high Cronbach's $\alpha = .85$ as found by Judges et al. (2003).

Parental Employment. Parental employment was measured using Weer et al.'s (2006) measure. This measure aims to determine the extensiveness of parental employment during the participants' childhood years. Participants were asked to indicate whether their parents were employed full-time part-time or not during three different childhood stages. These stages are during infancy/preschool (0 – 6 years), primary school (7- 12 years) and high school (13 – 18 years) (Weer et al., 2006). Different weighting was applied to each life stage to measure parental employment's extensiveness during the respondent's childhood years (Weer et al., 2006). The weightings were applied as follows; full-time employment was weighted with a 2, part-time employment was weighted with a 1, and if the parent did not work, a 0 was allocated (Weer et al. 2006). The number of years within each life stage was then multiplied by the relevant weighting. Each stage's scores were summated to produce a score representing each parent's employment extensiveness during the respondents' childhood years. The scores could range from 0 (parent did not work at all) to 64 (parent worked full time for participants entire childhood). Higher scores would indicate extensive employment during the participants' childhood. The same procedure was followed for both maternal and paternal employment.

Parental Role Sharing. Parental role sharing was measured using an adapted version of the 2-items used in Cinamon's (2006) study. The first item related to the parental role sharing of housework, and the second item related to the role sharing of childcare. The responses

participants could select were (1) *my mother*, (2) *my father*, (3) *equally by both my parents* or (4) *other family members* (Swartz, 2018).

Anticipated work-family role planning. Participants were asked about the strategies they aim to employ to assist the balancing of their work and family roles in the future. Participants had to indicate whether they anticipate performing strategies on a 5-point Likert scale (where 1 = *Strongly do not anticipate doing so* to 5 = *Strongly anticipate doing so*). A sample item is “Talk to others about how strategies for how to balance your work and family roles”.

Demographic Characteristics

Demographic characteristics were measured using single items. The variables that were measured were age, gender, ethnicity and field of study. Participants were also asked whether they intend to get married and have children and at what age they expect this to occur. Additionally, participants were asked to respond to three statements relating to the COVID-19 lockdown restrictions and whether this made them look at their work and family roles in the future differently.

Statistical Tools

The data collected in Qualtrics was imported to IBM Software Package for Social Sciences (SPSS) Version 26 for cleaning and analysis. Validity analyses were conducted utilising Exploratory Factor Analysis (EFA) using principal axis factoring and oblique rotation. Prior to conducting the EFA, Kaiser-Meyer-Olkin (KMO) and Bartlett’s tests were conducted for each scale to ensure that the data met the criteria. Reliability analyses were conducted to measure each scale’s internal consistency using Cronbach’s alpha (Field, 2018). Hierarchical regressions were conducted to determine the predictors of AWFC after controlling for certain variables. ANOVA was also conducted to determine the between-group differences regarding AWFC.

Data Cleaning

Prior to performing any statistical analyses, the data were examined. Participants who were not currently studying towards a degree within the STEM industry were removed as their responses were not applicable in this study. Moreover, participants who omitted 25% or more of their responses were deleted from the sample (Field, 2018). This resulted in a final sample of $N = 388$ participants.

Results

Initial psychometric analysis

An Exploratory Factor Analysis (EFA) was conducted for each of the scales (AWFC, CSE, PPWFI and AWFRP) to establish any underlying dimensions of the constructs (Young & Pearce, 2013). The principle axis factoring method was used to determine the least number of factors that account for a common variance for a set of variables (Young & Pearce, 2013). Prior to performing the analysis, the data must meet a set of assumptions for an EFA to be deemed appropriate. First, Kaiser-Meyer-Olkin (KMO) is an assumption of sampling adequacy that needs to be met (Field, 2018). According to Field (2018), for this assumption to be met, the KMO value should be above .05. Second, Bartlett's test of sphericity is an assumption that ensures the items are adequately related (Field, 2018). Bartlett's test of sphericity needs to be significant ($p < .05$) for this assumption to be met (Field, 2018). In relation to the reliability analysis, a Cronbach's alpha value of .70 is deemed an acceptable level of internal consistency.

Factor Analysis

A factor analysis was conducted on the following scales: AWFC, PPWFI, CSE and AWFRP. All scales mentioned above met the assumptions for a factor analysis. The KMO values were well above .50, and Bartlett's test of sphericity was all significant ($p < .001$).

According to previous research, the AWFC scale consists of two factors and the items are correlated with one another (Cinamon et al., 2008; Coyle et al., 2015; Westring & Ryan, 2011). Since the items are correlated with one another, an oblique rotation was chosen for this analysis (Field, 2018). The first analysis revealed two factors with four items loading onto one factor, three loadings onto factor 2 and one loading onto both factors. Item 5 ("I will often be too tired at work because of the things I will have to do at home") was removed as the difference in the factor loadings for each factor was less than .30, which according to Watson (2018), is classified as grounds for removal. The analysis was then rerun and revealed two factors with four items loading onto factor 1, two items loading into factor 2 and 1 item cross-loaded onto both factors. Item 6 ("My personal demands will be so great that it will take away time from my work") was removed, and the analysis was rerun. The final EFA revealed two factors. Factor 1 represented anticipated work-to-family conflict, and Factor 2 represented anticipated family-to-work conflict. All 6 items had factor loadings above .30 and were therefore retained (Watson, 2018). Table 3 illustrates the final factor structure of AWFC. The two-factor structure

explained 63.44% of the variance, where factor 1 had an eigenvalue of 2.43 (explained 40.5% of the variance), and factor 2 had an eigenvalue of 1.37 (explained 22.9% of the variance).

Table 3

Factor Loadings for EFA of AWFC

		AW→FC	AF→WC
AWFC1	After work, I will come home too tired to do some of the things I'd like to do	.74	-.06
AWFC2	On the job, I will have so much work to do that it will take away from my personal interests	.76	-.02
AWFC4	My work will take up time that I'd like to spend with family/friends	.57	.10
AFWC2	My personal life will take up time that I'd like to spend at work	-.09	.73
AFWC3	My superiors and peers will dislike how often I am preoccupied with my personal life while at work	-.00	.625
AFWC4	My personal demands will be so great that it will take away time from work	.22	.497
Eigenvalues		2.43	1.37
Total variance explained (%)		40.5	22.9

Note. $N = 388$, AW→FC = anticipated work-family conflict; AF→WC = anticipated family-to-work conflict

An EFA using principal axis factoring with oblique rotation was conducted as the PPWFI scale items are assumed to be correlated. The analysis revealed one factor with an eigenvalue of 3.50 and explained 70% of the variance. Upon examining the scree plot, the unidimensionality of PPWFI was confirmed. As seen in Table 4 below, all the items load onto factor 1 ($.729 < r < .840$).

Table 4

Factor Loadings for EFA of PPWFI Scale

		PPWFI
PPWFI1	The amount of time my parent/guardian's job took up made it difficult to fulfil family responsibilities.	.84
PPWFI2	The demands of my parent/guardian's work interfered with their home and family life.	.83
PPWFI3	My parent/guardian's job produces strain that makes it difficult for them to fulfil family duties.	.80
PPWFI4	Things my parent/guardian wanted to do at home did not get done because of the demands of their job.	.752
PPWFI5	My parent/guardian had to miss family activities due to the amount of time he/she spent on work.	.729

Eigenvalue	3.50
Total variance explained (%)	70

Note. $N = 388$

For CSE, an EFA was conducted using principle axis factoring with varimax rotation. The first-factor analysis extracted three factors, with the majority of the items cross-loading onto all three factors. A reiterative item deletion process was then conducted due to a vast number of cross-loadings in the initial factor structure. Items were then removed from the highest cross-loading to the lowest cross-loading. These items were removed as the difference in the factor loadings for each factor was less than .30 (Watson, 2018). The items were removed in the following order: Item 7 (“Overall I am satisfied with my life”), Item 10 (“I do not feel in control of my success in my career”), Item 3 (“When I try I generally succeed”), Item 11 (“I am capable of coping with most of my problems”), Item 5 (“I complete tasks successfully”), Item 9 (“I determine what will happen in my life”) and Item 1 (“I am confident I get the success I deserve in life”). This resulted in the extraction of one factor with an eigenvalue of 2.63 and explained 52.7% of the variance (see Table 5 below).

Table 5

Factor Loadings for EFA of CSE

	CSE
CSE1 Sometimes I feel depressed	.615
CSE2 Sometimes when I fail I feel worthless	.765
CSE3 Sometimes, I do not feel in control of my work	.519
CSE4 I am filled with doubts about my competence	.603
CSE5 There are times when things look pretty bleak and hopeless to me	.688
Eigenvalue	2.63
Total variance explained (%)	52.7

Note. $N = 388$

For AWFRP, the EFA revealed one factor with an eigenvalue of 1.98 and explained 66.18% of the variance. The scree plot also confirmed the scales unidimensionality. Table 6 below, illustrates the factor structure ($.677 < r < .739$) of the AWFRP scale.

Table 6

Factor Loadings for EFA of AWFRP Scale

		AWFRP
AWFRP1	Try out different ways to balance my expected work and family roles.	7.39
AWFRP2	Talk to others about strategies for how to balance your work and family roles.	.691
AWFRP3	Read up about strategies regarding balancing work and family role responsibilities.	.677
Eigenvalue		1.98
Total variance explained (%)		66.18

Note. $N = 388$

Reliability Analysis

The internal consistency of AWFC, CSE, PPWFI and AWFRP was measured using Cronbach's alpha. This was done to measure the extent to which a scale is able to consistently produce the same results when employed in different environments (Field, 2018). The scales used in this study, namely CSE ($\alpha = .77$), AWFC ($\alpha = .70$), PPWFI ($\alpha = .89$) and AWFRP ($\alpha = .73$) were all reliable as they all met the threshold of $\geq .70$ or greater. As seen in Table 7 below, removing any additional items from each scale would decrease Cronbach's alpha value.

Table 7

Reliability: Variables under investigation

Scale	α	n	Corrected Item-Total Correlations	Cronbach's Alpha if item deleted
AWFC	.70	6	.326 < r < .489	.643 < r < .694
CSE	.77	5	.218 < r < .418	.695 < r < .759
PPWFI	.89	5	.684 < r < .779	.859 < r < .881
AWFRP	.73	3	.552 < r < .590	.634 < r < .660

Note. $N = 388$, α = Cronbach's alpha, n = number of items

Descriptive Statistics

Skewness and kurtosis of the continuous variables were observed. According to Field (2018), skewness refers to the extent to which the distribution has too many low scores or too many high scores, whereas kurtosis examines the width and height of the distribution. According to Field (2018), the skewness and kurtosis value should be between -2 and 2 for the

data to be considered normally distributed. This assumption is not always met in the social science research area. However, the analyses can still be used when this assumption is not entirely met (Egboro, 2015). AWFC, CSE, PPWFI and AWFRP were positively skewed, which meant that there were relatively low distribution scores. AWFRP was negatively skewed, indicating higher scores within the distribution (Field, 2018).

The descriptive statistics are displayed in Table 8 below. The table provides the means, standard deviations, skewness and kurtosis of the variables. Participants within the study experienced moderate levels of AWFC ($M = 16.25$, $SD = 3.651$). The participants also reported relatively average levels of CSE ($M = 18.85$, $SD = 4.394$), which means that they have less positive core self-evaluations of themselves. The students within the sample reported that their fathers worked ($M = 24.59$, $SD = 11.257$) more than their mothers ($M = 20.70$, $SD = 11.618$). The participants perceived their parents work interfering with their family quite often.

Table 8

Descriptive Statistics of Variables under Investigation

Variable	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
AWFC	16.25	3.651	.195	.121
CSE	18.85	4.394	.384	.173
PPWFI	14.20	4.891	.094	-.669
AWFRP	11.73	2.347	-.595	.155
Parental Employment	45.28	16.364	-	-
ME	20.70	11.618	-	-
PE	24.59	11.257	-	-

Note. *M* = Mean; *SD* = Standard Deviation; ME = Maternal Employment; PE = Paternal Employment

Only a few participants ($n = 203$) responded to the questions relating to the effects of the COVID-19 pandemic on their future work and family roles. The COVID-19 lockdown restrictions have made STEM students think differently about their work and family in the future ($n = 131$). 46% ($n = 93$) of respondents reported that the COVID-19 lockdown restrictions have made them worry about their work and family roles in the future. Some students (32.1%; $n = 65$) reported thinking differently about their career choice due to the COVID-19 lockdown restrictions.

Correlational Analysis

A correlation analysis was conducted using Person product-moment correlation. Table 9 below displays the correlation coefficients of all variables. When interpreting the strength of correlation coefficients, the following criteria was utilised in this study: correlations close to 0.1 are interpreted as small (weak), 0.3 as medium (moderate) and .05 as large (strong) (Cohen, 1988).

A significant negative moderate correlation was found between CSE and AWFC ($r = -.231$ $p < .01$) and a weak positive relationship was found between PPWFI and AWFC ($r = .162$ $p < .01$). A weak positive relationship was found between age and AWFC ($r = .131$ $p < .01$). No relationship was found between the remaining independent variables (parental employment and AWFRP) and AWFC. Owing to parental employment and anticipated work-family role planning not correlating with anticipated work-family conflict, it was expected that these variables would also not predict the outcome variable. Therefore parental employment and anticipated work-family role planning were omitted from the regression analysis.

Table 9

Correlation: Variables under study

	1	2	3	4	5	6
1. CSE	(.77)					
2. AWFRP	-.041	(.73)				
3. PPWFI	-.194**	-.031	(.89)			
4. Parental Employment	-.045	-.005	.194**	(-)		
5. AWFC	-.231**	.057	.162**	.017	(.70)	
6. Age	.003	.035	-.030	.006	.131**	(-)

Note: $N = 388$, CSE = core-self evaluations, AWFRP = anticipated work family role planning, PPWFI = perceptions of parental work family interference, AWFC = anticipated work-family conflict, ** = $p < .01$, Cronbach alpha's are reflected in brackets

Regression Analysis

A hierarchical regression was performed to determine how CSE, parental employment, PPWFI and AWFRP predicted AWFC while controlling for age. The hierarchical regression

related to proposition 1 to 4. According to Lewis (2007), a hierarchical regression allows the researcher to assess whether predictor variables explain a statistically significant amount of variance in the dependent variable after controlling for other variables.

Assumptions of Regression Analysis

Before a regression is conducted, several assumptions need to be met for the data to be considered appropriate for hierarchical regression analysis. First, the relationship between the independent and dependent variables needs to be linear (Field, 2018). Second, there should be no multicollinearity in the data (Field, 2018). Third, homoscedasticity assumes that the spread of the residuals' s should be constant at each point of the predictor variables (Field, 2018). Last, no influential cases should be biasing the model (Field, 2018). To assess this assumption, Cook's Distance statistic should be below 1. In two instances where Cook's Distance statistic was above 1, it was removed. Thus, all the assumptions were met, and the data was deemed appropriate for multiple regression.

Perceptions of parental work-family interference and core self-evaluations

A hierarchical regression was conducted between AWFC as the outcome variable and CSE and PPWFI as the predictor variables while controlling for the influence of age. CSE and PPWFI were found to significantly predict AWFC over and above the control variable age. See Table 10 below for further details. Age was entered into the analysis in Step 1 and explained 1.6% of the variance ($\beta = .126, p = .013$). Model 1 with only age is a valid model of prediction for AWFC ($F(1,384) = 6.221, p = .013$). After entering CSE and PPWFI in Step 2, the total variance explained by Model 2 increased by 5% ($F(1,382) = 14.219, p = .000$). Both CSE ($\beta = -.208, p = .000$) and PPWI ($\beta = .123, p = .014$) were significant predictors of AWFC. CSE was the strongest predictor of AWFC.

Table 10

Hierarchical Multiple Regression: DV = AWFC

Predictor Variables	β	<i>p</i> -value	ΔR^2	F_{Ch}	<i>p</i> -value for F_{Ch}
Model 1			.016	6.221	.013
Age	.126	.013			
Model 2			.068	14.219	.000
Age	.130	.008			
CSE	-.208	.000			
PPWFI	.123	.014			

Note. DV = Dependent Variable $R^2 = .084$ Adjusted $R^2 = .077$

ANOVA

A one-way ANOVA was conducted to determine whether parental role sharing responsibilities, maternal employment or paternal employment explained the group differences among STEM students AWFC. The ANOVA analysis relates to the propositions 5, 6 and 7. Prior to conducting the analysis, three primary assumptions need to be met. First, the data needs to be normally distributed (Field, 2018). Second, the samples need to be independent and last, the distributions need to have the same variances (Field, 2018). The Levene's test was used to evaluate the homogeneity of the variances. If the assumption of homogeneity of variance was not met, a Welch's test was conducted and interpreted (Field, 2018). Thus, all the assumptions required to conduct an ANOVA analysis were met.

Parental role sharing responsibilities and AWFC

Parental role-sharing responsibilities were measured using four responses: *my mother figure* and *my father figure, equally by both parents and other family members*. Two ANOVA analyses were conducted to determine whether the parental role sharing of housework and the parental role sharing of childcare influenced STEM students AWFC. The analysis of variance showed that there was no significant difference in anticipated work-family conflict due to parental role sharing of housework ($F(3,383) = 1.883$, $p = .132$) and parental role sharing of childcare ($F(3, 384) = .476$, $p = .699$).

Maternal employment AWFC

Maternal employment was measured at three different life stages of the respondent's childhood. These life stages consisted of 1) during infancy/preschool (0 – 6 years), 2) during primary school (7 – 12 years), and 3) during high school (13 – 18 years). Three ANOVA analyses were conducted to determine whether having a working mother or not having a working mother at different life stages influenced students AWFC.

The results of the ANOVA revealed no statistically significant differences between STEM students AWFC and the employment status of their mothers across the life stages 0 to 6 ($F(2,385) = .454$, $p = .636$), 7 to 12 ($F(2, 385) = .59$, $p = .555$) and 13 to 18 ($F(2,385) = .732$, $p = .481$). This means that there are no statistically significant differences in AWFC due to maternal employment.

Paternal employment and AWFC

Paternal employment was also measured using the three different stages of the participants' childhood. Three ANOVA analyses were conducted to determine whether having a working father or not having a working father at different life stages influenced students AWFC.

Similarly, no significant differences were found between the students AWFC and the employment status of their fathers across the life stages 0 to 6 ($F(2,385) = 2.37$, $p = .095$) 7 to 12 ($F(2,385) = 2.014$, $p = .135$) and 13 to 18 ($F(2,385) = .401$, $p = .670$). This means that there are no statistically significant differences in STEM students AWFC due to their fathers' employment status while growing up.

Table 11

Summary of Propositions and Findings

	Proposition	Finding
Proposition 1:	Core self-evaluations significantly explain the variance in anticipated work-family conflict.	Supported
Proposition 2:	Anticipated work-family role planning significantly explains the variance in anticipated work-family conflict.	Not supported
Proposition 3:	Perceptions of parental work-family interference significantly explain the variance in anticipated work-family conflict.	Supported
Proposition 4:	Parental employment significantly explains the variance in anticipated work-family conflict.	Not supported

Proposition 5:	Parental role sharing responsibilities significantly explain the variance in anticipated work-family conflict	Not supported
Proposition 6:	Maternal employment significantly explains the variance in anticipated work-family conflict	Not supported
Proposition 7:	Paternal employment significantly explains the variance in anticipated work-family conflict	Not supported

Discussion

This study's main objective was to further investigate the limited research area of anticipated work-family conflict by focusing on the role of parental modelling in shaping STEM students' anticipated work-family conflict. The study examined three forms of parental modelling: parental role sharing responsibilities, parental employment, and perceptions of parental work-family interference. The findings have shown that only perceptions of parental work-family interference and core self-evaluations significantly predict anticipated work-family conflict. The study also found no between-group differences in anticipated work-family conflict based on parental role sharing responsibilities and maternal and paternal employment. Lastly, the study also revealed core self-evaluations as a vital variable to consider when examining the work-family domain. This section will discuss the results of this study in relation to the literature and its contributions. The implications for practice, limitations of the current research and suggestions for future research will also be discussed.

Contributions of the current study

The current study is one of the first to examine the influence of three forms of parental role modelling and core self-evaluations in shaping STEM students anticipated work-family conflict and contributed to the limited research area. First, the findings have shown that the concept of anticipated work-family conflict is not limited to developed countries, but it is a phenomenon experienced globally. Second, the findings have shown that only perceptions of parental work-family interference and core self-evaluations were significant predictors of anticipate work-family conflict. Third, core self-evaluations have been found as an important variable in shaping STEM students' perceptions regarding anticipated work-family conflict. Last, the results revealed no statistically significant differences in anticipated work-family conflict due to parental role-sharing responsibilities and maternal and paternal employment. Interestingly, this study's findings did not support the popularly accepted views that parents play the primary role in influencing their children's views regarding the work and family domains.

Parental role modelling and AWFC

The regression analysis revealed perceptions of parental work-family interference as a predictor of STEM students anticipated work-family conflict even after controlling for age. Moreover, the regression analyses have also shown core-self evaluations to be the strongest predictor of anticipated work-family conflict. Therefore, the discussion is divided into four sections: perceptions of parental work-family interference and anticipated work family-conflict, anticipated work-family role planning and anticipated work-family conflict, parental employment and anticipated work-family conflict and parental role sharing responsibilities and anticipated work-family conflict.

Perceptions of parental work-family interference

Perceptions of work-family interference have not been examined in previous studies regarding anticipated work-family conflict. However, a similar variable, namely, perceived work to family conflict of parents, was examined by Basuil and Casper (2012). The authors utilised Bandura's (1971) social learning theory as a framework for their study. According to the social learning theory, young adolescents observe their parents' work and family behaviours. These individuals observe the extent to which their parents work interferes with their family life and vice versa. As a result, young individuals make assumptions and base their expectations of work-family conflict on their parent's behaviour. The current study's findings are consistent with the social learning theory as perceptions of parental work family interference was found to be a predictor of anticipated work-family conflict. Proposition 1 was therefore, supported.

The STEM students in this study reported relatively high levels of perceptions of parental work-family interference ($M = 14.20$; $SD = 4.891$). This suggests that participants recalled their parents work roles interfering with their family roles. However, this variable was measured based on the perception participants had while they were growing up. Thus, participants could have struggled to recall accurate recollections of what happened. This could be a potential reason as to why the perceptions of parental work-family interference values were so high.

A second possible reason for the high values of perceptions of parental work-family interference could be that students used their parents' current work-family interference as a reference point when responding to the items on this scale. When the survey was distributed to the STEM students at the well-known tertiary institution, South Africa was at the height of the

COVID-19 pandemic. Working parents were in the process of trying to adjust to the new norm of working from home while trying to manage their family responsibilities. Although working from home can be very beneficial, it also comes with quite a few challenges, work-family conflict being one of them (Buonocore et al., 2015). When working from home, workdays are often extended as employees often find it difficult to disconnect from their work and feel no excuse not to be available before or after hours (Schieman et al., 2020). As a result, the boundaries between work and family began to blur, where work spills over into family responsibilities and vice versa. Participants, therefore, could observe this behaviour and use it to evaluate their parents' work-family interference during their childhood.

Anticipated work-family role planning

Proposition 2 was not supported. The regression has revealed that anticipated work-family role planning is not a valid predictor of anticipated work-family conflict. This study's findings are inconsistent with Barnett et al. (2003), who found that emerging adults who planned for their future work and family roles anticipated less work-family conflict. Role planning is crucial during students' university years as these students have not yet committed to career or marriage. During this time, students should consider the dynamics of being involved in work and family roles and develop effective plans to balance their involvement in each role (Woo & Lee, 2010). This could decrease the potential stress and conflict that students may be experiencing when occupying both work and family roles (Woo & Lee, 2010). In contrast, the consequence of STEM students not planning for work-family conflict in the future could lead to students being susceptible to the adverse outcomes of work-family conflict. STEM students are more likely to experience work-family conflict in their future roles due to the industry's demanding nature.

There has been an increase in careers within the STEM industry which provides more opportunities to women than in the past, as this industry was previously dominated by men (Minnotte & Pedersen, 2020). Since the participants are currently pursuing a STEM qualification, it can be assumed that these students have intentions to work. Moreover, most of the participants ($n = 245$) indicated that they intend to have children in the future. One can then speculate that most participants are expecting to work and have a family in the future. This would imply that the students expect to engage in both work and family roles. It seems possible that these results are due to participants feeling that they are capable to participate in both work and family roles actively and therefore are not anticipating experiencing work-family conflict. Consequently, the students are there less likely to participate in work-family role planning.

These participants may not be concerned regarding their ability to manage future work and family roles.

A second explanation could be that these students are not aware of the need to plan for their future work and family roles. The involvement level in planning for the future decreases when an individual is unaware of the need for multiple role planning (Woo & Lee, 2010). Therefore, the students in this study could not anticipate planning for their future roles as there is no immediate need. Adding to this could be the effects of the COVID-19 pandemic. Many individuals have increased anxiety and have gone into survival mode to ensure they can navigate this new norm (Schieman et al., 2020). The concerns of role planning could be impossible in situations where individuals are already experiencing feelings of being overwhelmed (Woo & Lee, 2010). As a result, there has been a shift in focus, which may explain why the students in this sample are not concerned about planning for their future roles.

Parental Employment

Research suggests that parental employment significantly impacts the child's development as it affects the child's functioning. Parental employment has been found to potentially affect the child's development and educational attainment (Lindeboom et al., 2009). Children learn about their parents' careers by observing their parents' involvement in work-related activities (Levine & Hoffner, 2006). This then has the ability to shape children's perception of work-family conflict. However, no study has investigated the influence of parental employment on anticipated work-family conflict of STEM students.

Proposition 3 was not supported. The regression analysis revealed that parental employment was not a valid predictor of anticipated work-family conflict. It is evident that there is a shift in parents being the primary role models for children. As mentioned before, in South Africa, primary caregivers are not limited to individuals' biological mother or father. In South Africa, grandparents, especially grandmothers, play an essential role in caring for their grandchildren. They often become the primary caregivers of their grandchildren and could therefore be used as primary role models. A possible explanation for the inconsistent results could be that grandparents did not work for periods of time while children grew up.

A second possible explanation could be that the careers STEM students aim to occupy may be substantially different from the jobs their parents have had across the different stages of their lives. With the continuous advancement of technology, organisations often pressure their employees to be highly productive and constantly connected (Wajcman & Rose, 2011).

Consequently, the boundaries between work and family domains become blurred. This has become more apparent in recent years (Wajcman & Rose, 2011). Therefore, these differences may lead students to expect high levels of anticipated work-family conflict regardless of their parents' employment patterns.

The current COVID-19 pandemic has led to the government declaring a national lockdown, which resulted in many individuals being restricted from working from home to maintain social distancing. Students were also impacted as they were required to continue their academic studies from home. The lockdown implications meant that the entire household had to manage the conflict between work and family life. Due to the extended lockdown period, households had to manage both their work and family roles continuously. Students were then exposed to their parents navigating between these two roles and observed how they managed to cope. This could explain the results as students identified how their parents work interfered with their family roles, but their parents have managed to balance these two roles effectively. The participants could anticipate that they will also manage both roles as they have observed their parents effectively navigating the work and family domains.

Research suggests that parental employment may impact young children's assumptions and experiences of work and family domains. This common thread has not been found among STEM students at the University of Cape Town.

Maternal employment

Only three studies have examined the influence of maternal employment on students' anticipated work-family conflict (Baigraim & Harrison, 2013; Barnett et al., 2003; Weer et al., 2006). However, the results have been inconclusive, resulting in many unanswered questions regarding the influence of maternal employment. The current study's finding is consistent with Weer et al. (2006), who found that maternal employment history did not impact the level of anticipated work-family conflict experienced by students. In contrast, Barnett et al. (2003) found that students who observed the mothers work extensively while growing up experienced less anticipated work-family conflict.

Mothers tend to have a more substantial influence on their children's career decisions or aspirations (Weer et al., 2006). Barnett et al. (2003) found that mothers were the most influential individual young adults consult regarding their career choice. This suggests that mothers provide the support to ease their children's anxieties regarding their future career and family roles (Askari et al., 2020). Contrary to popular belief, no statistically significant

differences were found between STEM students anticipated work-family conflict and their mother's employment status across the life stages 0 to 6; 7 to 12 and 13 to 18. Proposition 4 was therefore, not supported.

It could be possible that students do not use their mother's employment history as a basis when anticipating their future capabilities but instead use their mother's ability to successfully manage work their work, and their family roles (Weer et al., 2006). Therefore, students' responses to their mother figures employment may be based on the quality of their mother's experiences. As a suggestion, future research should examine whether students' perceptions of their mother's ability to balance their work and family roles successfully strengthens the relationship between maternal employment and anticipated work-family conflict. Additionally, the mother's ability to successfully manage their work and family roles should also be examined to determine whether it enhances students' core self-evaluations.

Paternal employment

Proposition 5 was not supported. No statistically significant differences were found between STEM students anticipated work-family conflict and their fathers' employment status across life stages 0 to 6, 7 to 12 and 13 to 18. Even though paternal employment was expected to influence students' anticipated work family conflict based on the social learning theory, the current study found that it did not influence the level of anticipated work-family conflict experienced by STEM students. Traditionally, fathers are seen as the breadwinner and are expected to throw all their energy into work to provide for their family (Fulcher et al., 2015). Thus, paternal employment is not a new experience for students. This could be a potential reason why the employment history of STEM students father figures did not impact the level of anticipated work-family conflict expected.

Parental role sharing responsibilities

Cinamon et al. (2006) is the only researcher to date that has examined the influence of parental role sharing on students anticipated work-family conflict. Family role participation expectations could lead to an increase in work-family conflict among couples who share housework and childcare responsibilities equally. As children grow up, they observe these behaviours. Cinamon et al. (2006) found that students who grew up with their parents equally sharing housework and childcare responsibilities would anticipate lower levels of anticipated work-family conflict. The results of the current study, however, are inconsistent with Cinnamon et al. (2006) findings as parental role sharing of housework and childcare did not

have a significant effect on STEM students anticipated work-family conflict (i.e. anticipated work-family conflict was not dependent on whether students were exposed to their parents equally sharing responsibilities). Proposition 6 was therefore, not supported.

The reason for this finding is not entirely apparent, but it may be due to the shifts in role modelling. The constant advances in technology have made social media a part of our daily lives (Bolton et al., 2013). Thus, social media has provided a platform for individuals to observe others' behaviours (Bolton et al., 2013). Social media has amplified the move to a more equal society. Many influential and powerful individuals display that women can be successful in both their work and family domains.

Moreover, these individuals are also advocating for men to be as involved in household and family responsibilities. As students observe these behaviours, they could see these influential individuals as role models and aspire to the equal society they are promoting even if they are not in line with their parent's behaviours. This could potentially highlight the shift from parents being primary role models to social media playing an important role in young adults' perceptions. Social media could also become an important role model when young students enter adulthood (Levine & Hoffner, 2006).

The finding that parental role sharing responsibilities did not influence the participants' anticipated work family conflict has shown that when housework and childcare responsibilities are equally shared amongst parents, role sharing did not influence STEM students anticipated work-family conflict. A possible explanation for the insignificant results found could be that some participants may not be exposed to a nuclear family structure (i.e. present mother and father). In a South African context, various family structures are not aligned with traditional norms (Budlender & Lund, 2011). For example, some families rely on domestic helpers to assist with housework and childcare responsibilities. The reliance on domestic helpers and the shift in men and women occupying equitable careers could have led to the students observing their parent's role sharing responsibilities as outdated and not related to their future work and family roles and their anticipated work-family conflict.

Core self-evaluations

Core self-evaluation is a personality trait that was examined in this study. It refers to an individual's evaluations about themselves, their abilities and self-worth (Westring & Ryan, 2011; Chang et al., 2012). Individuals with positive core self-evaluations approach challenging or stressful tasks instead of avoiding them. Research has found that individuals with high core

self-evaluations experience less work-family conflict (Boyar & Moseley, 2007; Haines et al., 2013). By extension, it is expected that students who have high core self-evaluations about themselves are more likely to experience less anticipated work-family conflict.

Moreover, individuals who indicate high CSE scores might see work as high demand and as a challenge, which may provide a primary motivational factor that may positively affect their behaviour to fully use all available resources to finish work and family responsibilities (Boyar & Mosely, 2007). Boyar and Moseley (2007) also state that individuals with high CSE levels may likely develop skills to manage WFC by effectively utilising resources from the work to assist a level of success in the family roles and vice verses. The findings of this study are in line with Westring and Ryan's (2011) study that found core self-evaluations to be a predictor of anticipated work-family conflict. Core self-evaluations were found to be the strongest predictor of anticipated work-family conflict. Proposition 7 was therefore supported

Interestingly, the STEM students reported average levels of core self-evaluations ($M = 18.85$; $SD = 4.394$). This means that the participants did not show high or low levels of positive evaluations about themselves, their abilities and self-worth. A possible explanation for this finding could be due to other personality traits that may have compensated for the absence of high positive core self-evaluations.

Personality researchers suggest one comprehensive description of an individual's personality traits, namely the Five-factor model of personality (Rantanenm, Kinnunen & Pulkkinen, 2013; Wayne, Musisca & Fleeson, 2004). These personality traits are neuroticism, emotional stability, extraversion, openness to experience, agreeableness and conscientiousness. Extraversion refers to an individual who is active, assertive, energetic and enthusiastic (Rantanemn et al., 2013). Individuals with high extraversion may accomplish more tasks within a specified amount of time. They may also experience less fatigue due to their high levels of energy. As a result, these individuals are more likely to seek out challenges and finding appropriate solutions (Tews, Noe, Scheurer & Michel, 2016). These individuals could therefore be more likely to incorporate informal learning into their regular routines. STEM students could, therefore, anticipate incorporating informal learning to manage anticipated work-family conflict.

Core self-evaluation scale

Judges et al. (2003) core self-evaluation scale has been theorised to be a unidimensional scale that consists of four specific core constructs. These traits are self-esteem, self-efficacy,

neuroticism and locus of control. In addition, judges et al. (2003) found that the 12-item scale revealed a unitary factor structure and concluded that the scale is valid. Therefore, this scale has been used in some studies and have been found to be valid and reliable.

Upon investigating the scale's validity, the analysis revealed conflicting results to the scale's theorised characteristics. Initially, a three-factor structure was revealed, with majority of the items cross-loading onto all three factors. Then, a reiterative item deletion process was conducted, resulting in the extraction of one factor with five items loading onto that factor. This finding is not consistent with any study to date. A possible explanation for this factor structure could be due to the wording effect, a systematic method variance triggered by negatively and positively worded items (Gu, Wem & Fan, 2014). According to Gu et al. (2014), when including both positively and negatively worded items onto the same scale, it may lead to a method effect, thereby introducing false method variance into the items' relationship. Consequently, the wording effect lowers the correlations between positively and negatively worded items on the scale resulting in a poor model fit based on the original hypothesised factor structure (Gu et al., 2014). The remaining items on this scale were all negatively worded items, suggesting that the wording effect could have influenced the factor structure of the core self-evaluation scale.

Limitations

The current study aimed to examine the effects of parental role modelling and core self-evaluations on STEM students anticipated work-family conflict. Anticipated work-family conflict is a theoretically underdeveloped and relatively new construct. This study, therefore, aimed to contribute to this limited body of knowledge. The current study has a few limitations that need to be addressed in future research. This section will discuss the limitations of the current study.

First, the data collected was solely reliant on the perceived experiences and self-report data. It was also collected at a single point in time. Therefore, it could not accurately represent the study variables, as it may change its properties (Louw, 2012). Rosnow and Rosenthal (2014) concluded that while the self-report survey method effectively collects sample data that cannot be manipulated, it raises the risk of response bias. The following variables were based on STEM students' perceptions while growing up, 1) perceptions of parental work-family interference, 2) maternal employment, and 3) paternal employment. Participants could, therefore, not be able to recall their experiences growing up as a child. Moreover, participants

may also not be able to quantify their experiences with the variables under study, potentially leading to inaccuracies.

A second limitation is the use of a cross-sectional design. The main disadvantage of a cross-sectional design is that it cannot determine the cause and effect between relationships, but it can only examine associations (Sedgewick, 2014). This is because cross-sectional designs measure a particular construct at a single point in time. Therefore, this study could not determine whether the variables under study actually influenced STEM students' anticipated work-family conflict. A longitudinal design would have been better suited to examine possible cause and effect relationships between the variables under study (Field, 2018). However, due to time and resources constraints, this was not possible.

Third, the sample was recruited from a single tertiary education institution, limiting the generalizability of this study's findings as the ability to apply these findings at other tertiary institutions is uncertain. Gailbraith and Smith (2012) explained the importance of having a well-represented sample as it impacts the ability to make inferences regarding the particular population under study.

Suggestions for future research

Future studies could benefit from examining the effect of social media on students anticipated work-family conflict. Social media is a powerful source of influence for young children, especially within this generation. The rise of social media influencers may lead to young adults viewing these individuals as influential role models. Social media influencers are a title given to individuals who have established some form of credibility in an industry, have access to a massive following base and can influence individuals to act based on their recommendations (Freberg & McGaughey, 2011). It is evident that parents are no longer the primary role model of young individuals as they learn about work and family through other sources (Levin & Hoffner, 2006). Social media is a powerful tool as it provides us with easily accessible information (Bolton et al., 2013). Future studies should, therefore, investigate the influence of social media on young individuals anticipated work-family conflict.

As a second suggestion, anticipated work-family conflict should be examined amongst high school students as the majority of studies have focused on students who are in the process of attaining their qualifications. Generally, high school students may not have made any decisions regarding their choice of study and careers (Brown & Cinamon, 2015). In contrast, university students would have already chosen a field of study and in turn, a career to pursue.

Therefore, future research should examine the experiences of anticipated work-family conflict among high school students to determine whether it influences their intended study path. Based on this, interventions can then be implemented and targeted at high school students to encourage students to pursue careers within the STEM industry.

Since core self-evaluation was the strongest predictor of anticipated work-family conflict, future researchers should explore core self-evaluation predictors. For example, researchers could examine the extent to which core self-evaluations are stable traits individuals possess or whether they change based on performance or specific life events (Rantanen et al., 2013). Interventions could then be designed to improve students' core self-evaluations about themselves to successfully navigate through their work and family roles in the future. However, there is also a need for ongoing validation of the core self-evaluation scale as there seem to be conflicting conclusions regarding its psychometric properties. Therefore, there is a need for the continuing development of the scale as this scale. Chang et al. (2015) further explained that the scale should be tested within many different settings to assess its validity.

Implications of the current study

The current study adds to the limited research regarding anticipated work-family conflict. It contributes to the literature regarding the

parental role modelling. Furthermore, the study provides information relating to anticipated work-family conflict experiences amongst stem students, of which little is known. The current study's findings have revealed that STEM students anticipate experiencing relatively high levels of work-family conflict. This is important as students may not pursue demanding career paths if they expect that they will be unable to effectively manage their work and family responsibilities (Fulcher et al., 2015; Savelle & O'Brein, 2016; Tan-Wilson & Stamp, 2015). Understanding this study's results within a broader social context is important, considering the potential benefits and disadvantages in interpreting the results.

Organisations could benefit from this study's findings as it has provided employers with information relating to their future employees. The awareness of the extreme demands of professions in the STEM industry should encourage organisations to implement family-friendly policies. Wayne and Casper (2016) stated that family-friendly policies allow for some level of flexibility for employees to structure their workdays, such as flexi-time, to account for their family responsibilities. The relatively high levels of anticipated work-family conflict experienced by STEM students indicate that this is a significant concern. Suppose STEM

students are aware of the family-friendly policies that organisations offer. In that case, it may alleviate some stress that they experience, resulting in reducing their anticipated work-family conflict.

Adding to this is the South African government's recent lockdown measures due to the COVID-19 pandemic, individuals are forced to work from home. This directly impacts the ability to manage both work and family roles. There are added pressures such as regular childcare, extended workdays, and not being in a conducive work environment. Companies' measures to comply with the lockdown could set the standard for future working arrangements as it has shown that working from home is a viable option. Thus, employers need to ensure that their family-friendly policies take this into account.

Anticipated work-family conflict also has implications for practice. The majority of the work-family sphere interventions are designed for employed adults experiencing challenges managing their work and family roles (Westring & Ryan, 2011). Therefore, it is important to understand the work-family conflict from a career development perspective to help individuals think about work-family issues before entering the workplace (Westring & Ryan, 2011). Suppose the predictors of anticipated work-family conflict are examined. In that case, appropriate interventions can be designed to help students enhance these predictors. For example, within the vocational area, career counsellors could utilise this information to develop interventions to help students cope with the demanding expectations of their work and family roles. These intentions could ease the work-family conflict that students may experience. This is further supported by Minnotte & Pedersen (2019), who stated that due to the challenging nature of balancing work and family, practitioners have called for an early intervention strategy aimed at university students to support their future work-family roles.

Conclusion

In conclusion, it is evident that the transition from childhood to early adolescence is a challenge for many individuals as they start to think through their work and family roles for the future, and South African STEM students are not excluded from this transition. There has been a slight shift in traditional gender norms whereby women are able to pursue non-traditional careers such as careers in the STEM industry. This study has added to the limited research regarding anticipated work-family conflict by examining the influence of three forms of parental role modelling on STEM students anticipated work-family conflict. There is a limited amount of research regarding anticipated work-family conflict within South Africa.

This study has provided further support for anticipated work-family conflict being a global phenomenon experienced by individuals in developing countries.

The current study has shown that parental role modelling may not be a strong predictor of anticipated work-family conflict as initially expected. Only perceptions of parental work-family interference and core self-evaluations were found to be predictors of anticipated work-family conflict. As initially expected, core self-evaluations were found to be more of a significant predictor of anticipated work-family conflict than any form of parental role modelling. Therefore, the findings of this study highlight the importance of personal characteristics in managing anticipated work-family conflict. Appropriate interventions aimed at improving their core self-evaluations could result in decreased anticipated work-family conflict.

It is evident from this study that commonly accepted views regarding parents being the primary role models for young individuals might no longer be accurate or relevant. As anticipated work-family conflict is a universal phenomenon, future research needs to examine potential influencing factors that extend beyond their parents. This can then be used by university counsellors and support staff to implement necessary interventions. Anticipated work-family conflict has the ability to negatively impact students' thoughts regarding their future career and family aspirations (Tan-Wilson & Stamp, 2015). This is important as it suggests a need to equip STEM students with the appropriate tools and resources to make informed decisions regarding their future work and family roles. This is imperative for individuals who aspire to successfully balance the demanding nature of their work and family roles. Moreover, it will encourage individuals to pursue careers within this industry.

References

- Askari, S. F., Liss, M., Erchull, M. J., Staebell, S. E., & Axelson, S. J. (2010). Men want equality, but women don't expect it: Young adults' expectations for participation in household and childcare chores. *Psychology of Women Quarterly*, 34(2), 243-252.
- Bagraim, J. J., & Harrison, E. (2013). The anticipated work-family conflict of future business managers: Does gender and maternal employment matter? *South African Journal of Business Management*, 44(3), 41-46.
- Bandura, A. (1977). *Social learning theory* (Vol. 1). Prentice Hall: Englewood Cliffs.
- Barnett, R. C., Gareis, K. C., James, J. B., & Steele, J. (2003). Planning ahead: College seniors' concerns about career-marriage conflict. *Journal of Vocational Behavior*, 62(2), 305-319.
- Basuil, D. A., & Casper, W. J. (2012). Work-family planning attitudes among emerging adults. *Journal of Vocational Behavior*, 80(3), 629-637.
- Beigi, M., Wang, J., & Arthur, M. B. (2017). Work-family interface in the context of career success: A qualitative inquiry. *Human Relations*, 70(9), 1091-1114.
- Bennett M. M., Beehr T. A., & Ivanitskaya L. V. (2017). Work-family conflict: Differences across generations and life cycles. *Journal of Managerial Psychology*, 32(4), 314-332.
- Bolton, R. N., Parasuraman, A., Hoefnagels, A., Migchels, N., Kabadayi, S., Gruber, T., Loureiro, Y. K., & Solnet, D. (2013). Understanding Generation Y and their use of social media: A review and research agenda. *Journal of Service Management*, 24(3), 245-267.
- Boyar, S. L., & Mosley Jr, D. C. (2007). The relationship between core self-evaluations and work and family satisfaction: The mediating role of work-family conflict and facilitation. *Journal of Vocational Behavior*, 71(2), 265-281.
- Brown, D., & Cinamon, R. G. (2015). Choosing a high school major: An important stage in the career development of Israeli adolescents. *Journal of Career Assessment*, 23(4), 630-644.
- Budlender, D., & Lund, F. (2011). South Africa: A legacy of family disruption. *Development and Change*, 42(4), 925-946.
- Buonocore, F., Russo M., & Ferrara, M. (2015). Work-family conflict and job insecurity: Are workers from different generations experiencing true differences? *Community, Work & Family*, 18(3), 299-316.
- Chang, C. H., Ferris, D. L., Johnson, R. E., Rosen, C. C., & Tan, J. A. (2012). Core self-evaluations: A review and evaluation of the literature. *Journal of Management*, 38(1), 81-128.
- Cinamon, R. G. (2010). Anticipated work-family conflict: Effects of role salience and self-efficacy. *British Journal of Guidance & Counselling*, 38(1), 83-99.

Anticipated work-family conflict among STEM students

- Cinamon, R. G., Most, T., & Michael, R. (2008). Role salience and anticipated work-family relations among young adults with and without hearing loss. *The Journal of Deaf Studies and Deaf Education*, 13(3), 351-361.
- Cinamon, R. G. (2006). Anticipated work-family conflict: Effects of gender, self-efficacy, and family background. *The Career Development Quarterly*, 54(3), 202-215.
- Cinamon, R. G., Weisel, A., Tzuk K. (2007). Work-family conflict within the family. *Journal of Career Development*, 34(1), 79-100.
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. New York, NY: Routeledge Academic.
- Coyle, E. F., Van Leer, E., Schroeder, K. M., & Fulcher, M. (2015). Planning to have it all: Emerging adults' expectations of future work-family conflict. *Sex Roles*, 72(11-12), 547-557.
- Dasgupta, N., & Stout, J. G. (2014). Girls and women in Science, Technology, Engineering and Mathematics: STEMing the tide and broadening participation in STEM careers. *Policy Insights from the Behavioral and Brain Sciences*, 1(1), 21-29.
- De Andrade, A. L., Ferraz, K. R., de Oliveira, M. Z., & Hatfield, E. (2019). Anticipated work-family conflict in Brazilian university students. *Psychologica*, 62(2), 95-116.
- Egboro, F. O. (2015). The implications of parametric and non-parametric statistics in data analysis in marketing research. *International Journal of Humanities and Social Science*, 5(6), 74-83.
- Etikan, I. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1). 1-4.
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.) London: Sage.
- Fox, M. F., Fonseca, C., & Bao, J. (2011). Work and family conflict in academic science: Patterns and predictors among men and women in research universities. *Social Studies of Science*, 41, 715-735.
- Freberg, K., Graham, K., McGaughey, K., & Freberg, L. A. (2011). Who are the social media influencers? A study of public perceptions of personality. *Public Relations Review*, 37(1), 90-92.
- Fulcher, M., Dinella, L. M., & Weisgram, E. S. (2015). Constructing a feminist reorganization of the heterosexual breadwinner/caregiver family model: College students' plan for their own families. *Sex Roles*, 73(3-4), 174-186.
- Goode, W. J. (1960). A theory of role strain. *American Sociological Review*, 25(4) 483-496.

- Goldberg, A. E. (2013). "Doing" and "undoing" gender. The meaning and division of housework in same-sex couples. *Journal of Family Theory & Review*, 5(2), 85-104.
- Greenhaus, J. H., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of Management Review*, 10(1), 76-88.
- Gu, H., Wen, Z., & Fan, X. (2015). The impact of wording effect on reliability and validity of the Core Self-Evaluation Scale (CSES): A bi-factor perspective. *Personality and Individual Differences*, 83, 142-147.
- Gutek, B. A., Searle, S., & Klepa, L. (1991). Rational versus gender role explanations for work-family conflict. *Journal of Applied Psychology*, 76(4), 560-568.
- Hartmann, D., & Swartz, T. T. (2006). The new adulthood? The transition to adulthood from the perspective of transitioning young adults. *Advances in Life Course Research*, 11, 253-286.
- Heilbrunner, N. N., (2011). Stepping onto the STEM pathway: Factors affecting talented students' declaration of STEM majors in college. *Journal for the Education of the Gifted*, 34(6), 876-899.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513-524.
- IBM Corp. Released 2020. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.
- Jacobs, J. A., Ahmad, S., & Sax, L. J. (2017). Planning a career in engineering: Parental effects on sons and daughters. *Social Sciences*, 6(1), 2.
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The core self-evaluations scale: Development of a measure. *Personnel Psychology*, 56(2), 303-331.
- Levine, K. J., & Hoffner, C. A. (2006). Adolescents' conceptions of work: what is learned from different sources during anticipatory socialization? *Journal of Adolescent Research*, 21(6), 647-669.
- Lindeboom, M., Llena-Nozal, A., & van Der Klaauw, B. (2009). Parental education and child health: Evidence from a schooling reform. *Journal of Health Economics*, 28(1), 109-131.
- Loftus, M. C., Droser, V. A. (2020). Parent and child experiences of parental work-family conflict and satisfaction with work and family. *Journal of Family Issues*, 41(9), 1649-1673.
- Mary, A. A. (2014). Re-evaluating the concept of adulthood and the framework of transition. *Journal of Youth Studies*, 17(3), 415-429.

- Matthews, R. A., Winkel, D. E., & Wayne, J. H. (2014). A longitudinal examination of role overload and work–family conflict: The mediating role of interdomain transitions. *Journal of Organizational Behavior*, 35(1), 72-91.
- Michel, J. S., Kotrba, L. M., Mitchelson, J. K., Clark, M. A., & Baltes, B. B. (2011). Antecedents of work–family conflict: A meta-analytic review. *Journal of Organizational Behavior*, 32(5), 689-725.
- Michael, R., Most, T., & Cinamon, R. G. (2013). The contribution of perceived parental support to the career self-efficacy of deaf, hard-of-hearing, and hearing adolescents. *Journal of Deaf Studies and Deaf Education*, 18(3), 329-343.
- Minnotte, K. L., & Pedersen, D. E. (2019). Department Environment and Work-to-Life Conflict Among Faculty in the STEM Fields. *Journal of Family Issues*, 40(10), 1299-1320.
- Netemeyer, R.G., Boles, J. S. & McMurrian, R. (1996). Development and validation of work-family conflicts and work-family conflict scales. *Journal of Applied Psychology*, 81, 400 -410.
- Peake, A., & Harris, K. L. (2002). Young adults' attitudes toward multiple role planning: The influence of gender, career traditionality, and marriage plans. *Journal of Vocational Behavior*, 60, 405–421.
- Qualtrics (2020). *Qualtrics* (Version 07/2020), Provo, Utah. <https://www.qualtrics.com>.
- Rantanen, J., Kinnunen, U., & Pulkkinen, L. (2013). The role of personality and role engagement in work-family balance. *Horizons of Psychology* 22,14-26.
- Schieman, S., Badawy, P. J., A. Milkie, M., & Bierman, A. (2020). Work-Life Conflict During the COVID-19 Pandemic. *Socius*, 7, 2378023120982856.
- Sedgwick, P. (2014). Cross-sectional studies: advantages and disadvantages. *Bmj*, 348(2276), 1-2.
- Super, D. E. (1980). A life-span, life-space approach to career development. *Journal of Vocational Behavior*, 16(3), 282-298.
- Talukder, A. M. H. (2019). Supervisor support and organizational commitment: The role of work–family conflict, job satisfaction, and work-life balance. *Journal of Employment Counseling*, 56(3), 98-116.

- Tan-Wilson, A., & Stamp, N. (2015). College students' views of work-life balance in STEM research careers: Addressing negative preconceptions. *Life Sciences Education*, 14(3).
- Waite, A. M., & McDonald, K. S. (2019). Exploring challenges and solution facing STEM careers in the 21st Century: A human resource development perspective. *Advances in Developing Human Resources*, 21(1), 3-15.
- Wajcman, J., & Rose, E. (2011). Constant connectivity: Rethinking interruptions at work. *Organization Studies*, 32(7), 941-961.
- Watson, J. C. (2017). Establishing evidence for internal structure using exploratory factor analysis. *Measurement and Evaluation in Counseling and Development*, 50(4), 232-238.
- Wayne, J. H., & Casper, W. J. (2016). Why having a family-supportive culture, not just policies, matters to male and female job seekers: An examination of work-family conflict, values, and self-interest. *Sex roles*, 75(9-10), 459-475.
- Weer, C. H., Greenhaus, J. H., Colakoglu, S. N., & Foley, S. (2006). The role of maternal employment, role-altering strategies, and gender in college students' expectations of work-family conflict. *Sex Roles*, 55(7-8), 535-544.
- Westring, A. F., & Ryan, A. M. (2011). Anticipated work-family conflict: A construct investigation. *Journal of Vocational Behavior*, 79(2), 596-610.
- Wiese, B. S., & Freund, A. M. (2011). Parents as role models: Parental behavior affects adolescents' plans for work involvement. *International Journal of Behavioral Development*, 35(3), 218-224.
- Wright, S. L., Kacmarski, J. A., Firsick, D. M., Jenkins-Guarnieri, M. A., & Kimm, A. J. (2019). Family influences on college students' anticipated work-family conflict, social self-Efficacy, and self-Esteem. *The Career Development Quarterly*, 68(2), 112-128.
- Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical and methodological differences. *European of Journal of Education*, 48(2), 311-355.
- Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*, 9(2), 79-94.
- Zahedani, Z. Z., Rezaee, R., Yazdani, Z., Bagheri, S., & Nabeiei, P. (2016). The influence of parenting style on academic achievement and career path. *Journal of advances in medical education & professionalism*, 4(3), 130.
- Zuo, J., & Tang, S. (2000). Breadwinner status and gender ideologies of men and women regarding family roles. *Sociological Perspectives*, 43(1), 29-43.

Appendices

Appendix A

Measures used in this study

Anticipated Work-Family Conflict Scale

1. After work, I will come home too tired to do some of the things I'd like to do.
2. On the job, I will have so much work to do that it will take away from my personal interests
3. My family and friends will dislike how often I am preoccupied with my work while I am at home.
4. My work will take up time that I'd like to spend with family/friends.
5. I will often be too tired at work because of the things I will have to do at home.
6. My personal demands will be so great that it will take away from my work,
7. My superiors and peers will dislike how often I am preoccupied with my personal life at work.
8. My personal life will take up time that I'd like to spend at work.

Core self-evaluation Scale

1. I am confident I get the success I deserve in life.
2. Sometimes I feel depressed.
3. When I try I generally succeed.
4. Sometimes when I fail, I feel worthless.
5. I complete tasks successfully.
6. Sometimes, I do not feel in control of my work.
7. Overall, I am satisfied with my life.
8. I am filled with doubts about my competence.
9. I determine what will happen in my life.
10. I do not feel in control of my success in my career.
11. I am capable of coping with most of my problems.
12. There are times when things look pretty bleak and hopeless to me.

Parental Employment

Please indicate whether your mother/father was employed full-time, part-time or not employed during the following ages:

Anticipated work-family conflict among STEM students

1. 0 to 6 years
2. 7 to 12 years
3. 13 to 18 years

Parental role sharing responsibilities

While growing up:

Majority of the household chores was done by

1. Mother figure
2. Father figure
3. Equally by both parents
4. Other family members

Majority of the child-rearing responsibilities were taken care of by

1. Mother figure
2. Father figure
3. Equally by both parents
4. Other family members

Perceptions of parental work-family interference

1. My parent/guardian had to miss family activities due to the amount of time he/she spent on work.
2. The demands of my parent/guardian's work interfered with their home and family life.
3. The amount of time my parent/guardian's job took up made it difficult to fulfil family responsibilities.
4. Things my parent/guardian wanted to do at home did not get done because of the demands of their job.
5. My parent/guardian's job produces strain that makes it difficult for them to fulfil family duties.

Anticipated work-family role planning

Please indicate to what extent you intend to do the following in the future

1. Talk to others about strategies for how to balance your work and family roles.

Anticipated work-family conflict among STEM students

2. Try out different ways to balance my expected work and family roles.
3. Read up about strategies regarding balancing work and family role responsibilities