Gender and Career Choice Behaviour: Social Cognitive predictors of persistence in Construction Education

Mariam Akinlolu and Theo C. Haupt
Department of Construction Management and Quantity Surveying, Mangosuthu University of Technology, Durban, South Africa.
Faculty of Engineering, Mangosuthu University of Technology, Durban, South Africa.

Abstract. This study applied the Social Cognitive Career Theory to determine the factors that influence student’s persistence in construction programs in the South African Context. The study further explores the possible differential validity of SCCT variables for men and women. A survey of 108 conveniently sampled South African undergraduate students, including 48 women and 60 men, enrolled in construction-related programs was conducted. The samples were drawn from student cohorts enrolled in construction management, civil engineering, property development, land surveying, building and quantity surveying. To test for gender differences in the degree of relationship between persistence and the socio-cognitive variables(predictors), the Fisher z test was performed by testing for differences in correlation coefficients between groups. Stronger relationships between persistence and social supports was found for women compared to men. Self-efficacy, outcome expectations, learning experiences and social supports were the most salient predictors for both men and women in construction programs.

Keywords: Career Choice, Construction, Construction Education, Gender, South Africa, SCCT, Persistence

1. Introduction
Many of the career theories developed have emphasised on individual constructs such as self-efficacy, goal representations, interests, and outcome expectations [1] [2]. The application of these career theories to different cultures and contexts has received limited attention [3] [4] [5]. Similarly, despite the significance of culture and the social environment, issues of diversity and inclusion are mostly viewed through a Western lens [6]. Although an increasing amount of research focusing on gender inequality and women’s career decisions has been conducted, the different dynamics in ethnicity and culture has been constantly neglected [7] [8].

Construction education in South Africa is an interesting and peculiar context in which to study the gender-differences in career choices. The construction industry is demonstrably male-dominated, which makes it hard for women to persist in construction-related programs as well as in the industry [9] [10]. Despite an extensive range of global legislation developed to promote women’s participation in construction, women are still underrepresented in the construction industry and more so among students in construction [9] [10] [11] [12]. While both first and third world countries share the problem of inadequate representation of women, women are very present in the construction workforce of some developing countries compared to European countries [13].
To increase the participation of women in construction education in South Africa, this study applies the Socio-Cognitive Career Theory (SCCT) to understand the gender differences in career choices and persistence of students in construction-related programmes. This study contributes to research on the career choice of women in male-dominated environments in non-Western cultures [11]. Research trends on women in male-dominated work suggest that contextual and environmental factors may play a major role in shaping the attitudes, motivations, and career choices of women [5] [14]. Numerous studies aimed to examine the declining participation in construction among South African women may not fully capture the dynamics of career choices for women aspiring to undertake careers in construction [15]. Therefore, the study attempts to expand the SCCT beyond its individualistic roots to incorporate more social and environmental factors. Also, the study predicts that the SCCT constructs variables may have differential influences on the persistence of women and men.

This paper presents an overview of women in construction in South Africa, followed by the conceptual framework and 12 hypotheses to be tested. The rest of the paper discussed the methodology adopted and findings from the survey. Based on the findings from the study, recommendations and implications for the study are presented.

2. Women in Construction: The South African Context

Gender inequality and discrimination against women in the South African context can be traced back to the patriarchal structures and system of the apartheid era [16]. Patriarchy puts men in control of property and at the centre of making decisions. Patriarchy was deeply rooted within the South African society and catalysed to propagate discrimination against women to the extent that it was a standard way of life. Numerous studies have indicated that women all over the world have been perceived as secondary to men, with men possessing more power in most interpersonal relationships [10] [16] [17]. For decades, women have faced all forms of sociological and economic discernments; and their access to the workforce was restricted [18]. In instances where they had access, they were placed in junior levels at the workplace [19]. Formal and informal workplace relationships are influenced by a history of socio-cultural patriarchal attitudes that perceive women as inferior to men, thereby, putting them in minor positions in public and private sectors [17].

Findings from the 18th Commission for Employment Equity Report illustrated that women are still immensely underrepresented in all sectors in South Africa [11]. Although the population of economically active women has increased over the years, the South African labour market is still highly segregated with a stout horizontal and vertical division of labour [20]. From 23% in 1960 to 41% in 1991 and 45.3% in 2017 majority of the women in the labour force are employed in finance, trade, private households, community, and services [20]. Fewer women are found in the formal labour market because they are confronted with social prejudices favouring marriage and motherhood over education and pursuing a career [21].

Paternalism has greatly affected the South African education sector [22]. Dominant hegemonic views of stereotypical masculinity and femininity have opposite effects on the education of women. Historical, cultural, and socio-economic factors play a significant role in the impediments that arise in the progress of South African women [23]. There is a need to investigate the educational system for discriminations against women within the context of South Africa’s norms and ideologies [22]. The disparities in the level of educational attainment between women and their male counterparts sometimes go beyond the inequality in the education system [24]. In many African communities, South Africa inclusive, parents have higher expectations of the male child compared to the girl child. The education of their daughters is perceived as a less-valuable investment because they are being married off into another family that will benefit from her education. At the same time, their sons will perpetuate the family name [25]. These
parental influences have contributed to the high number of female dropouts and low enrolments in schools [26].

Low levels of enrollment and inconsistent quality of education have been identified for women, especially in science and engineering [22]. A pattern of underrepresentation of women across traditional fields of study has been recorded since 2004 [22]. Enrolment is higher for men in engineering and technology subjects at universities/universities of technologies [11] [15] [27]. Women are more concentrated in humanities and education courses [11]. This study adopts the SCCT to increase the participation and promote inclusivity of women in the South African construction industry.

3. Conceptual Framework

The SCCT conceptualised by Lent et al. [1] and derived from Bandura’s [2] social cognitive theory, builds upon the social learning theory which claims that one’s behaviour influences and is influenced by the external environment and personal factors [2] [28]. SCCT is a direct application of the social cognitive theory by Bandura [2] and elaborates exclusively on the educational interest formation, career development, performance, and persistence of individuals in their career endeavours. It applies the social cognitive theory to academic experiences and career development and emphasises that career decisions are controlled through the interaction of cognitive process with environmental influences [29]. Processes whereby the educational and professional interest of individuals are developed; the influence of interests and other socio-cognitive mechanisms on career choices and the attainment of different levels of career performance and persistence are outlined in the SCCT [3].

Focusing on the role of cognitive factors such as self-efficacy, goal representations, outcomes and expectations in the career development of an individual, SCCT posits that these factors interact with internal and individual variables such as gender, to influence the career behaviour of an individual [5][29] [30].

Numerous studies examining SCCT have emphasised individual cognitive factors, paying little attention to environmental factors. However, this study sought to investigate the significance of environmental variables, which are perceived to have a greater influence on career decisions and focuses specifically on students’ persistence in completing construction-related disciplines as a significant outcome in construction education. In this context, persistence refers to an individual’s intention to stay in a chosen university programme and earn a degree. In examining the predictors of persistence, noteworthy are the differential barriers experienced by men and women in the career choice process assumed to result from socialisation as it has been highlighted in numerous studies [5] [28][31].

To apply SCCT in this study, the conceptual model builds upon the framework of the SCCT’s model of career choice developed by Lent et al. [1] and integrates both environmental and individual cognitive variables. This study examined the extent to which self-efficacy beliefs, outcome expectations, goal representations, social supports, learning experiences and interests influence the intention of students to persist in construction programs. The model suggests that career choices in construction are related to individuals’ perceptions of their ability to perform on various construction-related activities, their goals, and their expectations of the consequences of engaging in these activities [31] [32]. This study predicts that these identified variables will have a positive influence on persistence and may have differential influences on the persistence of women and men. Therefore, the conceptual model in Figure 1 highlights the interaction of gender with learning experiences, social supports, outcome expectations, goal representations, self-efficacy and interests their influences on student’s persistence behaviour in construction education.

3.1 Self-efficacy

From the social-cognitive perspective, self-efficacy is a set of beliefs concerned with specific performance domains and interact complexly with external and contextual factors [4]. These beliefs help to determine the choice of activities, environments, persistence, and emotional reactions to certain
events. Self-efficacy is a person’s perception of their capabilities and ability to perform at certain levels in a specific domain that influence certain events which have an impact on their lives [29][33]. It is a conviction by a person that a target can be achieved [28] [33]. Self-efficacy beliefs are predominantly determined by four sources: performance accomplishments, vicarious learning, social persuasion, and emotional arousal [4]. Commonly, a person has a higher level of self-efficacy when they believe they have required competency and efficacy to obtain necessary results [34]. Elements of self-efficacy are perceived to assist a person in determining their choice of activities, degree of persistence and emotional reaction to situations [5]. Introduced to career development literature by Hackett and Betz [35] self-efficacy constructs have been identified as a major predictor of career choice [33]. Therefore, it is hypothesised that:

\[ H1a. \text{There is a positive relationship between self-efficacy and career choice for men and women.} \]

![Diagram](image)

Figure 1: Persistence in a construction-related program

With regards to self-efficacy in traditional and non-traditional careers, Hackett, and Betz [35] found consistent and significant differences between men and women. Corresponding levels of self-efficacy were reported for male undergraduate students with regards to non-traditional and traditional careers. In contrast, female students reported significantly lower self-efficacy for non-traditional careers compared traditional careers. In comparison to women, men had higher expectations in their abilities to complete necessary job tasks and educational requirements in traditional and non-traditional occupations. For women, confidence was mostly expressed about traditional professions [34]. A positive correlation was found between self-efficacy and interest to non-traditional careers for both genders. Therefore, women who had low self-efficacy and low expectations of their abilities to persist in non-traditional occupations were unlikely to undertake such occupations. Therefore, it is hypothesised that:
H1b. Self-Efficacy is more strongly related to career behaviour for women than men.

3.2 Social Supports

Although numerous studies have adopted the SSCT framework, a majority have emphasised more on individual and cognitive variables, ignoring one of the main constructs of SCCT - the influence of social and contextual variables [5]. A major influencing variable on career decisions is social support [4] [36]. Support from parents, teachers and peers as crucial social supports in the occupational aspirations career decision making and persistence of students is well documented in the literature [5].

The agreement of an individual with a parent’s expectations was dependent on his or her occupational aspirations [37]. Among the various kinds of social supports, parental support is considered the most significant in the life of a young person [5]. The influence of parents plays a key role in the choice persistence of students in engineering majors [29] [38]. Lent et al. [39] investigated the relationship between social supports and career behaviour and decisions of university students in engineering. Findings from the study indicated that career choices and student’s aspirations were influenced by persistent behaviour, and supports from family members, peers, and teachers. Based on empirical evidence, it is hypothesised that;

H2a. There is a positive relationship between social supports and career choice for men and women.

Although, numerous studies claimed that perceived parental expectations are positively correlated with student’s career choices and aspirations, these results have been interpreted differently. In the context of social support, experiences of boys and girls are dissimilar in terms of encouragement and support from parents, teachers, and peers [29]. Hazari et al. [40] found statistically significant differences between male and female physics students regarding social support variables such as home environment, encouraging parents and teachers. Women tend to receive more career guidance from trusted networks such as family and peers compared to men [41].

Enrolments of women in engineering majors have been associated with support from their families compared to their male counterparts [36]. Although the experience of women and men in male-dominated majors did not differ across social cognitive variables, perceived social support was significantly higher for women [42]. Richman [36]; Hazari et al. [40]; Dabney and Tai [42] cited parental support as a significant influence on the career choices of women in male-dominated fields. Studies have revealed that compared to their male counterparts, female entrants into the construction industry are more likely to be influenced by family members, teachers or role models who have some experience of working in construction [43]. Several studies have argued that women require more social support to persist and overcome barriers to participation in male-dominated fields compared to men [5][44]. Additional social support may be required for women to help them overcome the barriers to their participation. Therefore, in the context of construction, it is hypothesised that;

H2b. Social supports are more strongly related to career behaviours for women than men.

3.3 Goal Representations

Goals play a significant role in the career behaviour mechanism [1]. Goals are the determination to undertake a particular action or to initiate a certain future outcome [45]. Goal representations result in extra input by a person in the relevant domain, inspiring the person to proceed energetically, making a career choice in the domain through organised planning [1]. In most cases, a person defines some criteria for certain behaviours depending on their expectations and beliefs, and these criteria are referred to as goals [4].

Numerous studies have suggested that several factors related to goals influence career choice behaviour [29]. It is expected that firmly held goals will more likely influence career entry choice behaviours [1] [5]. Goals are also perceived to have a strong motivational effect on career choice behaviour to the extent
that they are specific and clear, although maybe challenging, are attainable and proximal [4]. Although social, environmental factors and personal history shape the career behaviour of a person, goal setting guides behaviour in instances where there are no external reinforcements and increases the likelihood that desired outcomes will be attained [29]. Goals are considered as an implicit parameter of the career choice and decision-making process [5]. Career aspirations, choices and decisions are all significant concepts of goal representations [1]. Therefore, it is hypothesised that:

**H3a. There is a positive correlation between goal representations and career choice for men and women.**

Goal representations may reflect the personal, social and career aspirations of an individual [5]. The likelihood of students with higher goal representations to undertake a career have been found to be greater than students with lower goal representations [4]. Becares and Priest [46] found that the level of goal representations was a predictor of career choices in STEM for men. On the contrary, women’s career choices in STEM were found to be dependent on the influence of external factors. Due to the influence of socialisation on goal representations, men and women may acquire different goals from the gender socialisation process. Consequently, these gender differences may affect career choice behaviour in several ways [47]. Therefore, it is hypothesised that;

**H3b. Goal representations are more strongly related to career choice for women than men.**

### 3.4 Outcome Expectations

Outcome expectations refer to a person’s beliefs relating to probable response outcomes and consequences of performing certain actions [30]. Career choice behaviour is perceived to be significantly dependent on the subjective likelihood that a particular action will yield a certain outcome as well as the value a person places on those outcomes [39]. According to Bandura [34], “people act on their judgements of what they can do, as well as on their beliefs with regards to the likely consequences of their actions”. Physical outcomes (money), social outcomes (approval) and self-evaluative outcomes were highlighted as the types of outcome expectations [34]. Outcome expectations have been identified as one of the most salient predictors of career choice behaviour as individuals have positive expectations from engaging in the behaviour [48]. Career development theories emphasising the consequences of decision making implicitly have also acknowledged the significance of outcome expectations [48]. Career choice behaviour is highly dependent on the likelihood that certain actions will produce specific outcomes [49]. Therefore, it is hypothesised that;

**H4a. There is a positive correlation between outcome expectations and career behaviour for men and women.**

The extent to which men and women differ in the interpretation and expectation of outcomes is found to account for the gender differences in career choices [31]. Gender role socialisation may lead women to have less confidence in their abilities and perceives themselves to be less competent than men [48]. Consequently, women may have lower outcome expectations for non-traditional activities as compared to their male counterparts. Several studies have suggested that lower expectations for success could hinder women from undertaking non-traditional careers, especially if they do not perceive these careers as important or interesting [29][40]. Therefore, it is hypothesised that;

**H4b. Outcome expectations are more strongly related to career behaviours for women than men.**

### 3.5 Learning Experiences

Career choice behaviour is guided by a combination of learning experiences with person and contextual factors [4]. Studies have argued that previous learning experiences promote future career behaviours and that an accumulation of different kinds of reinforcements is responsible for career choices and that these prior experiences influence future career choice behaviour [5][39]. During the socialisation process, the environment exposes a person to a range of activities which might be of occupational
A person also experiences and observes other people within their environment, performing various vocational activities, exposing them directly and indirectly to diverse activities as well as differently reinforcing their aspirations to pursue certain activities [5]. By repetitively performing certain activities, role models and feedback from models, people refine their career choices [1]. Learning experiences produce values which are acquired through socialisation and fundamental social learning processes such as vicarious learning and self-evaluative experiences [50]. Interactions with family members, teachers, peers, role models, cultural and religious institutions and media sources influence personal values and standards which may consequently influence career choice behaviour [28].

Numerous studies have highlighted the significance of learning experiences in the career choice behaviour of students in engineering professions [5]. Classroom experiences such as classroom climate, interaction with teachers and peers, teaching styles provide learning experiences which influence academic and career [50]. Rubie-Davies et al. [51] found that learning experiences with regards to non-traditional occupations had a significant influence on the perceptions held by students. Therefore, in the context of construction, it is hypothesised that:

**H5a. There is a positive correlation between learning experiences and career choice for men and women**

Previous studies have shown that women, compared to men, perceive non-traditional careers as chilly and unsupportive, which serves as a barrier to women’s participation [5][51]. Hartman et al. [52] found that compared to men, learning experiences was a major predictor of the decisions of women to undertake and persist in male-dominated professions. Therefore, it is hypothesised that;

**H5b. Learning experiences are more strongly related to career behaviours for women than men**

### Interests

Interests are skills developed during a person’s socialisation process and ideally are translated into career choices, although social and environmental factors often influence the level of career aspirations and choice [46]. Career interests are patterns of likes, dislikes, and indifferences with regards to career-related activities and occupations [53]. Interests is a state of mind that emerges before and action and are perceived as a principal motivator of career choice behaviour. A person makes continuous choices, which are often regarded as unconscious, without considering how their time and efforts will be spent [54].

Career choices are identified as an outcome of interests [1]. The culminating body of research indicates that perceived real or anticipated experience of interest in career-related activities plays a significant role in career choice behaviour [5] [46]. Consistent with these assertions, the interest of individuals in vocational-related activities is strongly related to their preferences for that career [5]. Therefore, it is hypothesised that:

**H6a. There is a positive correlation between interests and career choice for men and women.**

Career interests are conceptualised as preserved patterns of likes, dislikes and indifferences relating to career-related tasks [1]. The significance of interest as a predictor of career choices suggest that men and women have similar levels of desire to undertake interesting work. Still, differences may exist in which careers they perceive to be interesting and why [5]. Therefore, women may find non-traditional related activities relatively less interesting than men because of the few opportunities offered with regards to interpersonal involvement. Based on this postulation, it is therefore hypothesised that:

**H6b. Interest is more strongly related to career choice for women than men.**
4. Methodology

The study implemented a descriptive survey design adopting a quantitative research approach (means, percentage, and the standard deviation). The Fisher z test was performed to test for gender differences in the degree of relationship between persistence and the socio-cognitive variables (predictors) by testing for differences in correlation coefficients between groups [57].

A questionnaire containing close-ended questions was used to capture the data for the study. SPSS version 26.0 was used to capture and compute the data. Students were conveniently sampled as the criteria for inclusion in the study were majoring in, land surveying, civil engineering, construction management, quantity surveying, building and architecture. Students at this stage were first to third-year students enrolled at two universities in the KwaZulu-Natal province of South Africa. Most of the study aimed at identifying the factors influencing the persistence and career choice in construction programs in South Africa.

4.1 Measures

- **Self-efficacy**: Self-efficacy was measured with five items. A sample item was “I am confident about being able to plan the steps needed to realise a project in my program”.
  - Social Support: This consisted of seven items. A sample item was “receiving support from my parents, and family members are important for my success”.
  - Learning experience: Learning experiences were measured with four items. A sample item was “I receive positive feedback and encouragement, especially from influential people in my life, such as my parents and teachers”.
  - Interests: Interests was measured with six scales. An example was “I enjoy performing tasks and activities related to my current program”.
  - Goal representations: Goal representations was measured with seven scales. A sample item was “I will have the opportunities for interesting work if I stay in my chose major”.
  - Outcome expectations: This consisted of fourteen items. A sample item was “I expect to learn new skills in my program and be able to use these skills and talents in future”.
  - Persistence in the program: The dependent variable was measured with four scales. A sample item was “I will change my current program”.

5. Analysis

Participants in the study were confirmed to represent students in male-dominated disciplines and were 108 undergraduate students at 2 Universities in the KwaZulu-Natal province of South Africa. There were 48 women and 60 men. Table 1 shows the mean scores for men and women for all the variables in the conceptual framework. Respondents indicated high intentions to persist in their program with mean scores of 4.31 and 4.26 for men and women, respectively. Further, male, and female students indicated equal levels of self-efficacy, outcome expectations, interests, learning experiences and goal representations. Compared to their men, women reported low levels of support from family, teachers, and peers.
Table 1. Gender differences in means.

|                      | Mean | Sig (2-sided test) |
|----------------------|------|--------------------|
|                      | Man  | Woman              |
| Self-efficacy        | 4.41 | 4.36               | 0.789 |
| Interests            | 3.92 | 3.81               | 0.363 |
| Outcome Expectations | 4.43 | 4.30               | 0.241 |
| Learning experiences | 3.13 | 3.66               | 0.697 |
| Social supports      | 4.08 | 2.59               | 0.000* |
| Goal representations | 3.40 | 3.21               | 0.616 |
| Persistence in the program | 4.31 | 4.26               | 0.256 |

Note: Significant at: *p < 0.05

Table 2 and Table 3 present separate correlation analysis for the men and women group. Table 2 presents the correlation analysis for the male respondents. Men indicated that self-efficacy, outcome expectations, learning experiences and social supports were positively related to their intentions to persist in their programs. Table 3 shows that female students perceived self-efficacy, social supports, outcome expectations, interests, learning experiences and goal representations were positively related to intentions to the persist in the program.

Therefore, we accept $H1a$ self-efficacy, $H2a$ social supports, $H4a$ outcome expectations, and $H5a$ learning experiences for both men and women. Partial support is shown regarding the positive effect of $H3a$ goal representations and $H6a$ interests.

Table 2. Correlation analysis for male group

|                              | M    | SD    | PEP  |
|------------------------------|------|-------|------|
| Persistence in the program (PEP) | 4.31 | 0.787 |      |
| Self-efficacy (SEF)          | 4.41 | 0.498 | 0.193* |
| Interests (INT)              | 3.92 | 0.616 | 0.014 |
| Outcome Expectations (OUE)   | 4.43 | 0.765 | 0.173* |
| Learning experiences (LEX)   | 3.13 | 0.997 | 0.125* |
| Social supports (SSP)        | 4.08 | 0.714 | 0.136* |
| Goal representations (GRP)   | 3.40 | 0.922 | 0.054 |

Note: Correlation is significant at *0.01 level (two-tailed)

Table 3. Correlation analysis for female group

|                              | Woman | SD    | PEP  |
|------------------------------|-------|-------|------|
| Persistence in the program (PEP) | 4.26 | 0.582 |      |
Table 4. Degree of relationship – persistence in construction programs

| Independent Variables          | Man   | Woman | Significance (one-tailed) |
|-------------------------------|-------|-------|--------------------------|
| Self-efficacy (SEF)           | 0.032 | 0.045 | 0.143                    |
| Interests (INT)               | 0.198 | 0.222**| 0.228                    |
| Outcome Expectations (OUX)    | 0.106 | 0.085* | 0.142                    |
| Learning experiences (LEX)    | 0.183*| 0.232*| 0.092                    |
| Social supports (SSP)         | 0.012 | 0.155*| 0.015*                   |
| Goal representations (GRP)    | 0.046 | 0.062 | 0.238                    |

Note: *p < 0.05, **p < 0.01 and p < ***0.001 level

Correlations between dependent and independent variables were compared for men and women to test the differential validity of the model variables. A one-tailed Fisher z-test was conducted to test for significant differences in the degree of relationship between persistence and the socio-cognitive variables. Table 4 presents the correlation coefficients between persistence in construction education for men, and women and significant differences between both groups.

Findings from the Fisher z test in Table 4 shows that self-efficacy, interests, outcome expectations, learning experiences and goal representations did not have differential influences for men and women. Therefore, we reject H1b, H3b, H4b, H5b, H6b. In contrast, a significance difference was found was for the influence of social supports and persistence. The influence of social supports was stronger for women compared to men. Therefore, Hb2 is supported.

6. Discussions

This study applied the Socio-Cognitive Career Theory to examine the factors that influence a student’s persistence in construction programs. Also, the study predicts that the SCCT constructs variables may have differential influences on the persistence of women and men pursuing construction careers in South Africa.

Findings from the study showed that SCCT variables such as self-efficacy, social supports, outcome expectations and learning experiences play an important role in predicting career choice behaviours of students such as persistence in construction education. Social variables did not significantly influence the model; therefore, the findings support the generalizability of SCCT.

The results further revealed that some SCCT variables have differential validity for men and women. Social support had a higher relationship with persistence for women compared to men. Considerable
support and encouragement from different sources have proven to be an important factor for women in non-traditional environments [54] [55]. Consistent with findings from similar studies, a strong level of social support (e.g., parental support, peer support and teacher support) is required to influence the career choice and aspirations of women in non-traditional careers such as construction [36].

Although it was revealed social supports is strongly related to persistence for women compared to men, the mean scores revealed that women (2.59) were perceived to receive lower levels of social supports compared to men (4.08). A possible explanation could be that in South Africa where several cultural practices and patriarchal principles undermine the role and status of women, socio-cultural beliefs and ideologies hinder opportunities for women to pursue higher education and explore careers in STEM fields [16][56]. Social and parental expectations and attitudes limit the career choices of girls in construction [9] [10][11]. An investigation of the influence of social supports on the career decisions of girls revealed that attitudes of teachers, instructors and textbooks depicting stereotypically feminine roles had been found to limit the progress and achievement of girls in non-traditional careers[13][22]. Verbal encouragements and portraying these careers as attractive and accessible will encourage women and stimulate their persistence [9].

7. Conclusions and recommendations for future research

The issue of women’s career choices in construction exist all over the world and have been analysed from various perspectives. Although, numerous studies have focused on factors affecting their career choices and their influences, very few studies have attempted to examine women’s experiences from a theoretical perspective to give greater meaning to women’s career choices in construction. Most of the studies on gender differences in construction careers have adopted a qualitative approach. In this study, gender differences were also examined. The cross-sectional nature of the current study prevents the certainty of assumptions of causality. Longitudinal designs would eliminate the limitation.

To further investigate the predictors of persistence, variables such as access to opportunity structures, the socialization process and perceived barriers may be considered for inclusion in the model. Contextual factors such as gender role stereotypes may also be considered to understand the persistence of construction students in South Africa. A potential avenue for future research may be to identify and examine the key social and cultural factors that influence gender dynamics and career choices in the South African context.

In conclusion, self-efficacy, outcome expectations, learning experiences and social supports were found to be the most salient predictors of persistence in construction programs for men and women in South Africa. However, other constructs of SCCT, such as interests and goal representations, were not supported. Furthermore, some results from the study, which are inconsistent with findings from similar studies emphasise the importance of understanding the underlying cultural assumptions which influence the gender dynamics in different contexts.

References

[1] Lent R W, Brown, S D, and Hackett, G 1994. Toward a unifying social cognitive theory of career and academic interest, choice, and performance. Journal of Vocational Behaviour, 45, 79.
[2] Bandura A 2001 Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52, 1–26.
[3] Ali S R and McWhirter E H 2006 Rural Appalachian youth’s vocational/educational postsecondary aspirations: Applying social cognitive career theory. Journal of Career Development,33, 87–111.
[4] Hunt H K, Flores L Y, Navarro, R L and Lee H S 2016 Increasing diverse students’ persistence in engineering: A social cognitive perspective. 46th Annual Frontiers in Education Conference Crossroads of Engineering and Business. October 2016, Erie, PA.

[5] Saifuddin SM, Dyke, L and Rasoul, M 2013 Gender and careers: a study of persistence in engineering education in Bangladesh. Gender in Management: An International Journal, 28 188-209.

[6] Syeda J and O’zibilgin M 2009 A relational framework for the international transfer of diversity management practices. The International Journal of Human Resource Management, 20 2435–53.

[7] Shapiro M, Ingols C, O’Neill R and Blake-Beard S 2009 Making sense of women as career self-agents:Implications for human resource development. Human Resource Development Quarterly, 20, 477-501.

[8] Wells, E.M., Delgado-Romero, E.A. and Shelton, K.L. 2010 An Analysis of Race and Ethnic Categories in Career Research From 1990 to 2007. Journal of Career Development, 37 503 – 518.

[9] Madikizela, K. and Haupt, T.C 2010. Influences on Women’s Choices of Careers in Construction: A South African Study. Construction Economics and Building, 10 1-13.

[10] English, J., Alves, S. 2018 Female students’ preparedness dominated disciplines and careers, The South African Journal of Industrial Engineering (SAJIE), 3 112-125.

[11] Akinlolu, M. and Haupt, T.C 2019 Investigating a Male-dominated Space: Female Students’ Perceptions of Gendered Cultures in Construction Workplaces, In Aigbavboa, C. and Thwala, W.(Eds) The Construction Industry in the Fourth Industrial Revolution, Springer Nature Switzerland.

[12] Male, S.A, Gardner, A., Figueroa, E. and Bennett, D. 2017 Investigation of students’ experiences of gendered cultures in the engineering workplaces. European Journal of Engineering Education, 3 360-377.

[13] English, J., Le Jeune, K. 2012. Do women and tradeswomen in construction share common employment barriers? Journal of Professional Issues in Engineering Education and Practice

[14] Ceci,S, William,W. and Barnett, S. 2009 Women's Underrepresentation in Science: Sociocultural and Biological Considerations, Psychological Bulletin, 135 218-261.

[15] Sangweni, N. and Root, D. 2015. Women in Construction: Hindrances that shorten the professional working life of female site engineers on construction sites in South Africa, MSc thesis, University of the Witwatersrand.

[16] McKeever, M. 2017. Educational Inequality in Apartheid South Africa, American Behavioral Scientist, 16 114 -131

[17] Hendrickse, R., 2012. Reshaping power–South Africa’s gender machinery reviewed. Administratio Publica, 20 110-127

[18] Yehualashet, Y.G. 2010. Have higher education institutions mainstreamed gender to contribute towards gender equality and women empowerment? a case study of the policies and practices of two tertiary institutions in Ethiopia, University of South Africa, Pretoria

[19] Rarieya, J.F.A. 2013. Breaking boundaries in leadership development: exploring the possibilities of action research in leadership development. (Keynote paper presented at the Kenya Educational Management Institute 3rd International Conference, "Best Practices in Leadership Capacity Development.

[20] Gradin, C. 2018. Occupational gender segregation in post-apartheid South Africa, WIDER Working Paper 2018/53, Helsinki, Finland.

[21] Chabaya, O., Rembe, S. and Wadesango, N. 2009. The persistence of gender inequality in Zimbabwe: factors that impede the advancement of women into leadership positions in primary schools, South African Journal of Education, 29 235-252.

[22] Akala, B. and Divala, J. 2016 Gender Equity Tensions in South Africa’s post-apartheid higher education: in defence of differentiation, South African Journal of Higher Education, 30 1-6.

[23] Ndebele, N., D. Featherman, M. Hall, M. Krislow and M. N. Coleman. 2010. The next twenty-five years: Affirmative action in higher education in the United States and South Africa. Michigan: The University of Michigan Press.
[24] Morrell, R., Epstein, D., Underhalter, E., Bhana, D. and Molets, R. 2010. Towards gender equality: South African schools during the HIV and AIDS epidemic, Perspectives in Education, 28.

[25] Dorrit, P., Rudwick, S. and Casale, D. 2011. Is marriage a dying institution in South Africa? Exploring changes in marriage in the context of ilobolo payments, Agenda: Empowering women for gender equity, 25, 102–111.

[26] Mugaga, R. and Akumu, T. 2010. School Drop-Out Rates for Teenage Girls Worrying Education, Observer.

[27] Haupt, T. and Fester, F. 2012. Women-owned construction enterprises: a South African assessment, Journal of Engineering Design and Technology, 10, 52–71.

[28] Charity-Leek, P. 2012. Women in Engineering: A Phenomenological Analysis of Sociocultural Contextual Meaning of Gender Roles, Ph.D. Dissertation, Cleveland State University.

[29] Ali, R. S. and Saunders, J. L. 2009. The Career Aspirations of Rural Appalachian High School Students, Journal of Career Assessment, 17, 172–188.

[30] Lent, R. W., Brown, S. D., and Hackett, G. 2000. Contextual supports and barriers to career choice: A social cognitive analysis. Journal of Counseling Psychology, 47, 36–49.

[31] Eccles, J. 1987. Gender roles and women’s achievement related decisions, Psychology of Women Quarterly, 11, 135–172.

[32] Eccles, J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., and Midgley, C. 1983. Expectations, values and academic behaviors, Perspective on achievement and achievement motivation, 75-146.

[33] Lent, R. W., Lopez, F. G., Sheu, H.-B., and Lopez, A. M., Jr. 2011. Social cognitive predictors of the interests and choices of computing majors: Applicability to underrepresented students, Journal of Vocational Behavior, 78, 184–192.

[34] Bandura, A. 1977. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191–215.

[35] Hackett, G., and Betz, N. E. 1981. A self-efficacy approach to the career development of women. Journal of Vocational Behavior, 18, 326–339.

[36] Richman, L.S., and vanDellen, M. and Wood, W. 2011. How Women Cope: Being a Numerical Minority in a Male-Dominated Profession, Journal of Social Issues, 67, 492—509.

[37] Concannon, J.P. and Barrow, L.H. 2010. Men's and Women's Intentions to Persist in Undergraduate Engineering Degree Programs. Journal of Science Education and Technology, 19, 133-145.

[38] Byars-Winston, A., Estrada, Y., Howard, C. Davis, D. and Zalapa, J. 2010. Influence of Social Cognitive and Ethnic Variables on Academic Goals of Underrepresented Students in Science and Engineering: A Multiple-Groups Analysis, J Couns Psychol., 57, 205–218.

[39] Lent, R. W., Brown, S. D., Schmidt, J., Brenner, B., Lyons, H., and Treistman, D. 2003. Relation of contextual supports and barriers to choose behavior in engineering majors: Test of alternative social cognitive models. Journal of Counseling Psychology, 50, 458–465.

[40] Zahra, H., Sadler, P.M and Tai, R. 2008. Gender Differences in the High School and Affective Experiences of Introductory College Physics Students, The Physics Teacher, 46, 423–427.

[41] Leslie, L.L., McClure, G.T., Oaxaca, R.L. 1998. Women and Minorities in Science and Engineering: A Life Sequence Analysis, Journal of Higher Education, 69, 239-76.

[42] Dabney, K. P., Chakraverty, D., and Tai, R. H. 2013. The association of family influence and initial interest in science. Science Education, 97, 395–409.

[43] Jimoh, R. A., Oyewobi, L. O., Adamu, A. N. and Bajere, P. A. 2016. Women professionals’ participation in the Nigerian construction industry: finding voice for voiceless. Organization, Technology and Management in Construction, 8, 1429-1436.

[44] Taasoobshirazi, G., and Carr, M. 2008. Gender differences in science: An expertise perspective. Educational Psychology Review, 20, 149–169.

[45] Bandura, A. 1986. From thought to action: Mechanisms of personal agency. New Zealand Journal of Psychology, 15, 1-17.

[46] Bécares L. and Priest N. 2015. Understanding the Influence of Race/Ethnicity, Gender, and Class on Inequalities in Academic and Non-Academic Outcomes among Eighth-Grade Students: Findings from an Intersectionality Approach, PLoSONE10,10, e0141363.
[47] Viola, K. V., Bucholz, E., Yeo, H., Piper, C. L., Bell, R. H., and Sosa, J. N. 2010. Impact of family and gender on career goals: results of a national survey of 4586 surgery residents, *Arch Surg.*, **145**, 418-24.

[48] Fouad and Guillen, A. 2006. Outcome Expectations: Looking to the Past and Potential Future, *Journal of Career Assessment*, **14**, 130-142.

[49] Locke, E. 1991. The Motivation Sequence, the Motivation Hub, and the Motivation Core, *Organizational Behaviour, and human decision processes*, **50**, 288-299.

[50] Kessels, U. 2014. Bridging the Gap by Enhancing the Fit: How Stereotypes about STEM Clash with Stereotypes about Girls, *International Journal of Gender, Science and Technology*, **7**.

[51] Rubie-Davies, C. M., Peterson, E. R., Sibley, C. G., and Rosenthal, R. 2015. A teacher expectation intervention: Modelling the practices of high expectation teachers, *Contemporary Educational Psychology*, **40**, 72-85.

[52] Hartman, H. and Hartman, M. 2009. Do Gender Differences in Undergraduate Engineering Orientations Persist when Major is Controlled, *International Journal of Gender, Science and Technology*, **1**, 62-82.

[53] Jin, L., Watkins, D., and Yuen, M. 2009. Personality, Career Decision Self-Efficacy and Commitment to the Career Choices Process among Chinese Graduate Students. *Journal of Vocational Behavior*, **74**, 47-52.

[54] Rogers, M.E., Creed, P.A. and Glendon, A.I. 2008. The role of personality in adolescent career planning and exploration: A social cognitive perspective, *Journal of Vocational Behavior*, **73**, 132-142.

[55] Jansen, M., Schroeders, U. and Lüdtke, O. 2014. Academic self-concept in science: Multidimensionality, relations to achievement measures, and gender differences, *Learn Indiv. Differ.*, **30**.

[56] Leslie, L., McClure, G. and Oaxaca, R. 1998. Women and minorities in science and engineering: A life sequence analysis, *J. Higher Educ.*, **69**, 239.

[57] Kilroe, M.C. 2009. An Exploration of young women and men’s perceptions of gender roles and their impact on relationships, *Unpublished Msc dissertation*.

[58] Ersin O., Canan Y. and Fikret, G. 2007. Evaluating the Significance Test When the Correlation Coefficient is Different from Zero in the Test of Hypothesis, *Communications in Statistics - Simulation and Computation*, **36**, 847-854,