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THE RELATIONSHIP BETWEEN SELF-EFFICACY BELIEFS AND CAREER CHOICES OF UNDERGRADUATE BUILT ENVIRONMENT STUDENTS

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This study examines the relationship between career choices and career self-efficacy beliefs among a sample of South African university students. This study surveyed 229 conveniently sampled students, including 116 men and 113 women enrolled in construction-related programs at two universities in South Africa. The samples were drawn from student cohorts enrolled in construction management, civil engineering, property development, land surveying, building and quantity surveying. Adopting the Social Cognitive Career Theory as the study's theoretical framework, an exploratory factor analysis yielded support for 5-item scale of self-efficacy. The EFA provided support for the internal validity and reliability of the scale. Results of structural equation modeling indicated that a significant relationship exists between self-efficacy and the student's decision to undertake a career in construction. The Mann-Whitney U and Kruskal-Wallis test was conducted to test for gender and SES differences in the extent to which self-efficacy beliefs influenced a career choice in construction. No significant differences were found in in the influence of self-efficacy beliefs between men and women. The study revealed significant differences between the high and medium SES groups. Findings of the current study have meaningful implication for practice in career choice and development in built environment occupations.

Keywords: career, self-efficacy, South Africa, university students

INTRODUCTION

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 (Madikizela and Haupt, 2010; English and Le Jeune, 2012). 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 (Male et al., 2017; English and Le Jeune, 2012; Akinlolu and Haupt, 2019). While both first and third world countries share the problem of inadequate representation of women, women are very present in the construction workforce

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of some developing countries compared to European countries (English and Le Jeune, 2012).

Making a career choice in the construction industry has not been a prevalent decision by women in South Africa (Enshassi and Mohammaden, 2012; Ozumba and Ozumba, 2012). Gender-related studies have revealed that women's career choices are affected by social and cultural role expectations (Powell et al., 2009). Due to South Africa's cultural diversity, many women are brought up with the understanding that they cannot undertake non-traditional careers such as construction and are advised to follow instead, 'soft skills 'occupations such as nursing (Sangweni, 2015). Their primary roles are to take care of the family and nurture their children, while their spouses are the breadwinners and are entitled to the workplace (Madikizela and Haupt, 2010; English and Le Jeune, 2012). Putting women's roles in such stereotypical boxes is one of the hindrances that shorten the working life of women and makes it impossible to maintain an upward trend in the number of women in construction (Enshassi and Mohammaden, 2012).

Recent studies have begun to dismiss the assumption that references made to women include all women and that all women have similar experiences (Byrd, 2009; Flores et al., 2010). Although in the South African context women may share a common gender, their cultural and socio-economic backgrounds vary (Louw-Harmse, 2015). The differences in their environments may influence the extent to which socio-cultural factors affect their career decisions more than others. Findings from previous studies suggest that demography and socio-economic differences may have an impact on the career decisions of women and their perceptions of career-related barriers. The aspirations of children are influenced within the prevailing social and cultural environment in which they develop. Personality interests, family, school, media, socio-economic and geographic settings were found to have an impact on the professional aspirations of children (Watson et al., 2011). While scholars have begun seeking the role culture and society plays on the career decisions of women and their development at the workplace, fewer studies have focused on inter-group differences (Holvino, 2010). Likewise, although numerous researchers have suggested a convergence of major career development theories (Eccles et al., 1984; Hackett et al., 1991; Lent et al., 1994) most recognize that this has still not been achieved. Although there have been numerous studies on the experiences of women in the construction industry (Chileshe and Haupt, 2010; Vainikolo, 2017), few studies have attempted to view their experiences from a theoretical perspective to give a larger meaning to their career choices and development. The lack of empirical research in this area suggests that more in-depth exploration of this problem is required.

Self-efficacy has been found to play a strong predictor of career choice behaviors in individuals (Sawtelle et al., 2012). Self-efficacy belief which is the core construct of the Socio Cognitive Career Theory (SCCT) and typically influences a person's academic and professional aspirations is influenced by learning experiences (Saiffudin et al., 2013). These beliefs are influenced by a person's success at a given task, as this information is integrated into the person's self-concept in that specific domain. High levels of self-efficacy are related to the extent to which a person intends to undertake a career in a particular profession (Kelly, 2009). Since self-efficacy deals with feelings of being capable of executing a specific task, self-

efficacy constructs are strong predictors of career behaviours (Betz and Hackett, 1981; Sheu et al., 2010). Lent et al. (2007); Kelly (2009); Huang (2013) reported a positive correlation between the confidence of men and women in their abilities to complete necessary job tasks and educational requirements in construction. Students who had low self-efficacy of their abilities to persist in construction were unlikely to undertake such occupations (Kelly, 2009).

Similarly, Foud and Smith (1996) considered the concept of domain-specific self-efficacy by testing self- efficacy as a predictor for intentions and choice in STEM careers and found that, self-efficacy directly influenced intentions, which resulted to a direct impact on career choice. Also, the study found that there was a strong positive correlation between self-efficacy and career decisions. Several studies highlight gender and SES difference in perceived self-efficacy in the decision to undertake a particular career (Ali and McWhirter, 2006).

Applying SCCT, the current study focused on role of self-efficacy on career choice. This study examines the gender and SES differences in self-efficacy as it relates to the career choices of undergraduate students in the Built Environment in South Africa. The study further determines whether differences exist among men and women and students from different socio-economic categories in the influence of self-efficacy beliefs on career choices.

THEORETICAL FRAMEWORK

This study was framed by the Social Cognitive Career Theory (SCCT) as it relates to the students 'career choices in the construction industry. SCCT (Lent et al. 1994) is a direct application of the social cognitive theory by Bandura (1989) and elaborates exclusively on the educational interest formation, career development, performance, and persistence of individuals in their career endeavours. 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 (Lent et al., 1994; Ali and McWhirter, 2006). Of interest to the present study is the cognitive process of self-efficacy.

Self-efficacy

Self-efficacy refers to "people's judgments of their capabilities to organize and execute courses of action required attaining designated types of performances" (Bandura, 1989). From the social-cognitive perspective, self-efficacy is a set of beliefs concerned with specific performance domains and interacts complexly with external and contextual factors (Shumba and Naong, 2012). These beliefs help to determine the choice of activities, environments, persistence, and emotional reactions to certain events (Malach-Pines and Kaspi-Baruch, 2008). Ali and McWhirter (2006) ; Kelly, (2009) ; Lent and Sheu (2010) described self- efficacy as 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. It is a conviction by a person that a target can be achieved (Hunt et al., 2017). Self-efficacy beliefs are predominantly determined by four sources: performance accomplishments, vicarious learning, social persuasion, and emotional arousal (Hunt et al., 2017). Commonly, a person has a higher level of self-efficacy when

they believe they have the required competency and efficacy to obtain necessary results (Bandura, 1977). Elements of self-efficacy are perceived to assist a person in determining their choice of activities, degree of persistence, and emotional reaction to situations (Peña-Calvo et al., 2016). Introduced to career development literature by Hackett and Betz (1981), self-efficacy has received wide attention in career literature and has been identified as a major predictor of choice to undertake and remain in a male-dominated career such as construction (Lent and Brown, 2006; Lent et al., 2008).

METHODOLOGY

A quantitative research method was adopted for the study. The study used a close-ended questionnaire in a survey of university students enrolled in construction-related programs in South Africa. Based on the advantages of the non-probability sampling method, the study used a conveniently selected sample from two public universities in the KwaZulu-Natal province of South Africa to participate in the study. The two universities were conveniently chosen because of their proximity to the researcher. Convenience sampling consists of selecting participants who are closest and more convenient to access (Sekaran and Bougie, 2010). This sampling method was preferred to conveniently select two universities, which were closest to the research domicile. Undergraduate students enrolled in construction-related programmes such as construction management, land surveying, building, civil engineering, quantity surveying and architecture in South African Universities were chosen as the sample frame. A sample size of 229 was used for the analysis.

The survey questionnaire was administered for five weeks. The questionnaires were designed using Google forms and administered electronically by sending out hyperlinks to the questionnaire via email and the WhatsApp platform. Google forms is a cloud-based and online tool used to create and customize questionnaires.

To determine the normality of the data gathered, the Kolmogorov-Smirnov Z and Shapiro-Wilk test were adopted. The Kolmogorov-Smirnov Z and Shapiro-Wilk tests indicated a non-normal distribution at $p=0.000$ for all the variables.

Following the result of the normality test, which revealed a non-normal distribution of data, a non- parametric test was deemed suitable to test for significant differences among the gender and SES groups concerning the study constructs. The study adopted the Mann-Whitney U test to the significant differences between the gender groups. Mann-Whitney U test is the non-parametric version of the parametric t-test used to assess independent samples. The Mann-Whitney U test compares the median of the two different groups on a continuous measure and converts the scores obtained to ranks. It then determines whether significant differences exist between the two groups (Pallant, 2011). The values to consider after the Mann-Whitney- U test are the Z value and the significance value, which is represented as the Asymp.Sig (2 tailed). A Sig. value of 0.05 or smaller ($p \leq 0.05$) indicates a significant difference between groups.

In this study, the Kruskal-Wallis test was adopted to test for significant differences between the SES groups. Similar to the Mann-Whitney U test, the Kruskal-Wallis

test is the non-parametric alternative to the one- way analysis of variance test(ANOVA) and is used to test for significant differences among three or more independent groups by comparing the scores on continuous variables (Field, 2013). An alpha level of 0.05 or less suggests a significant difference between groups.

Scale measures

The questions for the questionnaire survey were captured on a 5-point Likert scale where 1= strongly-disagree and 5= strongly agree. Respondents were required to indicate their level of agreement with statements about their career choices.

The scales utilized for the study are introduced below;

To measure self-efficacy in this study, the short version of the 25-item career choice self-efficacy scale derived from Betz, Klein, and Taylor (1996) was adopted and compressed.

DATA ANALYSIS

Demographic Information

Table 1 presents the demographic distribution of the respondents. There were 116 men (50.7%) in the sample. First year students had the largest number of participants with 94 students (41%), followed by 2nd year students at 87 (38%). This rate of participation is possible because of the 1st year cohort of students at South African Universities being usually larger than the later years or more advanced levels of study.

Table 1: Demographic distribution

Gender	No	Percent
Man	116	50.7%
Woman	113	49.3%
Total	229	100.00%
Year of Study		
1st year	94	41.0
2nd year	87	38.0
3rd year	30	13.1
4th year	18	7.9
Total	229	100.00%
Programme of Study		
Construction Management	110	48.0
Land Surveying	4	1.7
Quantity Surveying	50	21.8
Civil Engineering	17	7.4
Building	47	20.5
Architecture	1	0.4
Total	229	100.00%

Most respondents were enrolled in the discipline of Construction Management (n= 110; 48%), which also accounted for the largest number of participants because of both participating universities offering the programme. Architecture had the

lowest number of students (n=1; 0.4%) in the sample because only one of the universities offered the programme and typically had smaller numbers of students compared to the other disciplines and programmes.

To determine the socio-economic background of the respondents, participants were required to indicate the current or last occupation and the highest qualification of the breadwinner of their household.

Table 2 presents results relating to the socio-economic data of the participants. Most of the household breadwinners were unskilled workers such as housekeepers, farmers, waiters, and gardeners (n= 161; 70.3%), followed by graduate workers such as teachers, nurses, and police officers (n=39; 17%).

Table 2: Socio-economic background

Occupation of the breadwinner of the household	No	Percent
Unskilled	161	70.3
Skilled	21	9.2
Graduate	39	17.0
Specialist	8	3.5
Highest qualification of the breadwinner of the household	No	Percent
Post- Matric	59	25.7
Matric	54	23.7
High School	59	25.7
Primary School	57	24.9
Socio-economic Category	No	Percent
High SES	42	18.3
Medium SES	54	23.6
Low SES	133	58.1
Total	229	100.00%

Concerning the highest qualification of the household breadwinner, 59 (25.7%) had post-matric education, 54 (23.7%) had matric education, 59(25.7%) had high school education, and 57(24.9%) had primary school education. Based on the occupation and the highest qualification of the breadwinner of the household, 133 (58.1%) of the students were categorised to be of low socioeconomic status.

Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) was used to test the reliability and validity of the variables assessed in the study. The EFA aims to reduce data by finding the smallest manageable set of common components that will account for the intercorrelations of a set of variables (Pallant, 2011). The steps involved in the EFA include assessment of the suitability of the data for factor analysis, determining numbers for factor extraction, retaining and rotation, interpretation of resulting factors. The analysis included the evaluation of reliability (Cronbach alpha and composite), and discriminate and convergent validity of the survey instrument.

To determine the strength of intercorrelation among the variables, the Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test was used to assess the data's factor suitability (Pallant, 2011). Factor analysis is deemed appropriate when the value of the Kaiser-Meyer-Olkin Measure

of Sampling Adequacy (KMO) is higher than the acceptable minimum limit of 0.6 and a limit of 1 (Tabachnick and Fidell, 2013). The cut-off value of .05 for the Bartlett's Test of Sphericity indicates the significance and appropriateness of the factor model (Hair et al., 2010). Dimensionality and significance of factors were determined using Maximum likelihood. Maximum likelihood factoring is beneficial for confirmatory analysis and calculates population values for factor loadings that maximize the likelihood of sampling the observed correlation matrix from a population (Pallant, 2011). The Kaiser's criterion or the eigenvalue rule was adopted to determine the number of factors to retain (Pallant, 2011; Tabachnick and Fidell, 2013).

Five items of the self-efficacy scale were analysed. Inspection of the corrected item-total correlation values were above 0.3, indicating that the items measured the self-efficacy construct adequately. The Kaiser-Meyer-Olkin (KMO) for self-efficacy was 0.846 and a Bartlett's test of Sphericity with $p<0.000$ was obtained as shown in Table 3. A Cronbach's alpha of 0.836 was obtained for the self-efficacy scale, indicating adequate internal reliability. The results meet the criteria for factor analysability.

Table 3: KMO and Bartlett's Test for Self-Efficacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.846
Bartlett's Test of Sphericity	Approx. Chi-Square	414.757
	Df	10
	Sig.	.000

As shown in Table 4, factor loadings for all the five items were above the cut-off value of 0.30. For the communalities, all the factors were less than 0.999, indicating that all the items were within an acceptable range, and could be perceived as key factors determining the influence of self-efficacy on career choice.

Table 4: Self-efficacy factor statistics

Item	Element	Factor Loading	Corrected item-total correlation	Communalities	
				Initial	Extraction
SEF1	I have confidence in my ability to identify resources, limitations, andpersonal characteristics that might influence my career choices.	.693	.629	.406	.480
SEF2	I am confident about being able to collect information about trainingand employment opportunities for myself and manage them effectively.	.602	.557	.314	.362
SEF3	I am confident about being able to develop lists of priorities on the effective actions to successfully manage my own personal professional development	.622	.575	.333	.387
SEF4	I am confident about being able to plan the steps needed to realize aproject related to my profession	.857	.750	.576	.734
SEF5	I am confident about being able to address any difficulties related tomy career	.773	.681	.498	.598

From the results presented in Table 5, one factor with an eigenvalue of 3.024 accounted for 60.478% of the variance. The total variance explained is above the recommended cut-off value of 50% (Field, 2013). Since only one factor was extracted, it was unnecessary to rotate the solution. The solution was therefore considered unidimensional and adequate evidence of convergent and discriminant validity was provided for the self-efficacy construct.

Table 5: Initial eigenvalues for self-efficacy

	Initial Eigenvalues		
Factor	Total	% of Variance	Cumulative %
1	3.024	60.478	60.478
2	.604	12.084	72.562
3	.580	11.593	84.155
4	.479	9.577	93.732
5	.313	6.268	100.000

Multivariate analysis to assess gender differences

To test for significant differences between men and women, with regards to the five assessed self-efficacy variables, the Mann-Whitney U test was conducted.

Table 6 shows the mean scores for the career choice predictor, their rank orders for men group, women group and men and women combined. The Z-value and the Sig. value obtained from the Mann-Whitney U test were also presented. On the self-efficacy construct men reported a mean score of 20.51 while women reported 19.64.

Results of the Mann-Whitney U test revealed no significant differences among the gender groups with regards to their perception of the influence of self-efficacy (Z value =-1.380, p=0.168, as the Sig. values were less than the cut-off value of 0.05.

Table 6: Test Statistics for Gender and Career choice predictors

	Men MIS	Women MIS	Mann-Whitney U	
			Z-value	Sig.
Self-Efficacy	20.51	19.64	-1.380	0.168

Multivariate analysis to assess SES differences

Table 7 shows the mean scores for the self-efficacy variable, their rank orders for the high SES, medium SES and low SES groups. The Chi-square value, degree of freedom (df) and Sig. value obtained were also presented.

To test for the significant differences in the influence of self-efficacy between the SES groups, the Kruskal Wallis test was conducted. Table 7 shows that significant differences were found among the SES groups for self-efficacy (Chi-square =12.361, p=0.002), as the Sig. value was less than the alpha value of 0.05.

Table 7: Test Statistics for SES and Self-efficacy

	High SES	Medium SES	Low SES	Kruskal-Wallis		
	MIS	MIS	MIS	Test Static	Df	Sig.
Self-Efficacy	20.71	16.83	19.51	12.361	2	0.002

A post-hoc procedure was conducted to determine where the significant .

Table 8: Analysis of Dunn- Bonferroni Test

		Test Static	Std. Error	Adj. Sig.
Self-Efficacy	High-Low SES	18.819	13.556	0.495
	High-Medium SES	39.094	11.662	0.002
	Low-Medium SES	20.275	10.632	0.170

For self-efficacy, there was substantial evidence ($p < 0.002$) of a difference between high and medium SES group, as shown in Table 8. The mean score for the high SES was 19.51 compared to16.83 for the medium SES group.

DISCUSSION

Gender differences in the influence of self-efficacy

Gender has been identified to play a significant role in determining educational and career choices (Buchmann and Dalton, 2002). By viewing gender as a socially constructed aspect of the experience, it may be emphasized that it is a major sociocultural agent that helps shape career choices (Saifuddin et al., 2013). Findings from Wynn and Correll (2017) suggested that men and women have different perceptions of how self-efficacy beliefs influence their career decisions in male-dominated professions such as construction, as these professions have been resistant to the participation of women.

Findings from the study revealed no significant differences in the influence of self-efficacy among men and women.

Consistent with the findings in this study (Kelly, 2009; Huang, 2013; Stamarski and Son Hing, 2015) reported a positive correlation between the confidence of men and women in their abilities to complete necessary job tasks and educational requirements in construction. Students who had low self-efficacy of their abilities to persist in construction were unlikely to undertake such occupations (Kelly, 2009).

SES differences, self-efficacy and career choice

Socio-economic status is a person input variable that may influence a person's career choice (Ali and McWhirter, 2006). In this study, socioeconomic status (SES) was determined using a combination of the Nakao-Treas Socio-economic index and the Four Factor Index of Social Status based on ratings of occupation, education, income, and marital status (Nakao and Treas, 1994; Hollingshead, 1975). This index accounts for differentiated and unequal social status. Consistent with Blustein et al. (2015) this study determined the socio-economic status of young adults based on that of their parents or the head of their household, as they had not yet established their own (Ali and McWhirter, 2006). Diemer and Hsieh (2008) identified social class as a key variable that influences the way in which individuals make their career decisions. Trusty et al. (2000a); Trusty et al. (2000b); Diemer and Hsieh (2008) opined that students from lower SES backgrounds compared to those from higher SES backgrounds may have limited access to information, career guidance and financial resources, which could limit their choice of careers.

A statistically significant difference was found for the influence of self-efficacy on career choice among the three SES categories. Further tests revealed that disparities existed between the high SES and medium SES categories. These findings are consistent with previous studies indicating that group differences exist on self-efficacy with career choice (Ali and McWhirter, 2006; Gushue and Whitson, 2006).

Gushue and Whitson (2006) examined the influence of socio-economic background as related to self- efficacy and career decisions in traditionally male-dominated environments high school students and postulated that higher levels of self-efficacy was strongly associated with academic and career choice. Hannah and Kahn (1989) examined the influence of SES on self-efficacy, and on the careers considered by high school students, and found that low SES students reported lower self-efficacy beliefs compared higher SES students.

An investigation of the school-to-work transition of young adults from various SES backgrounds, conducted by (Kelly, 2009) revealed that respondents from high SES backgrounds reported higher levels of confidence in their abilities and career adaptability compared to their counterparts from other SES backgrounds. This finding is also consistent with past studies highlighting the influence of SES backgrounds on career choices (Trusty et al., 2000a; Trusty et al., 2000b). Respondents who aspired to undertake careers in construction-related professions reported higher SES. Consistent with Moore (2006) career choices in the construction industry is perceived as the least option; findings indicate that a career in construction is unappealing to students from impoverished backgrounds.

In the current study, students from high SES backgrounds indicated higher self-efficacy than their lower counterparts, as demonstrated by the mean scores. Empirical findings from (Ali and McWhirter, 2006; Lent et al., 2008) reported that societal issues influence career decisions, and these influences can be differentiated by an individual's personal circumstances such as poverty and parent's professional status. Ali and Saunders (2006) argued that students from lower SES backgrounds may have lower self-efficacy beliefs compared to their counterparts from higher SES backgrounds which has the potential influence their career choices. Lent et al. (2002) also argued that "how individuals construe the environment and themselves also affords the potential for personal agency and a sense of reliance in one's career development".

CONCLUSIONS

The study reported on focused on the role of self-efficacy on career choice in general and in construction in particular. More specifically, the gender and socio-economic status (SES) differences in self-efficacy of undergraduate construction students in South Africa were examined as they related to their career choices. This study confirmed that a relationship existed between self-efficacy and the decision of a student to pursue a career in the construction industry. However, no significant gender differences were found in the influence of self-efficacy beliefs between men and women. A positive correlation existed between the confidence of men and women in their abilities to complete necessary construction job tasks and activities and the requirements of construction-related education. Students who had low

self-efficacy about their ability to succeed in the construction industry were unlikely to want to work in the sector. On the other hand, students from high SES backgrounds had higher self-efficacy and were more likely to consider construction as a career option. Finally, given that very few studies have attempted to view the experiences of university students in construction programs from a theoretical perspective to determine what drives their career choices and development, further research in this area is required.

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