Mariam Akinlolu

Dr Mariam Akinlolu, Post-Doctoral Research Fellow, Department of Construction Management and Quantity Surveying, Mangosuthu University of Technology, Durban, South Africa. Phone: 0840503384, email: akinlolumariam@gmail.com, ORCID: https://orcid.org/0000-0002-6747-0205

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GENDER STEREOTYPES AND CAREER CHOICES: A CROSS-SECTIONAL STUDY ON A GROUP OF SOUTH AFRICAN STUDENTS IN CONSTRUCTION PROGRAMMES

RESEARCH ARTICLE[1]

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ABSTRACT

Gendered perceptions may determine the aspirations and expectations, as well as the academic and career choice of young people. This article examines the role of gender stereotypes as a predictor of career choices of students in construction. A survey of 229 conveniently sampled students, enrolled in construction-related programmes was conducted. The objectives of the study are to measure the relationship between gender stereotypes and career choice behaviour, and to measure the effect of gender and socio-economic status on how gender stereotypes influence student's career choices. The Mann-Whitney U and Kruskal-Wallis test were used to test for significant differences between gender and socio-economic status (SES) groups. Results show that, as opposed to men, women seem to perceive gender stereotypes as having more influence on their career choices than men. The study finds statistically significant differences in gender stereotypes among the low and medium socio-economic groups.

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ABSTRAK

Geslagtelike oortuigings kan die aspirasies en verwagtinge, sowel as die akademiese en beroepskeuse van jongmense bepaal. Hierdie studie ondersoek die rol van geslagstereotipes as 'n voorspeller van loopbaankeuses van studente in konstruksie. Met behulp van gerieflike monsterneming is 'n opname onder 229 studente, wat ingeskryf is vir konstruksieverwante programme, gedoen. Die doelwitte van die studie is om die verband tussen geslagstereotipes en beroepskeusegedrag te meet en om die effek van geslag en sosio-ekonomiese status te meet, oor hoe geslagstereotipes studente se loopbaankeuses beïnvloed. Die Mann-Whitney U en Kruskal-Wallis toets is gebruik om te toets vir beduidende verskille tussen die geslag en SES groepe. Resultate toon dat, in teenstelling met mans, sien vroue blykbaar dat geslagstereotipes meer invloed op hul loopbaankeuses het as vir mans. Die studie het statisties beduidende verskille in geslagstereotipes onder die lae en medium SES-groepe gevind.

1. INTRODUCTION

Numerous studies concerning the career choices and aspirations of young people validate the fundamental principle that the historical and cultural environment moulds the development of an individual, particularly the youth (Watson, McMahon & Longe, 2011: 414). Their career aspirations gradually become constrained and influenced during and after high school. During these stages, occupational aspirations become progressively realistic, and their self-identity develops through their interaction with the environment, primarily through exposure to adult career roles (Becares & Priest, 2015: 2). Young people become cognisant of career choices and opportunities as they become exposed to people in their immediate environment (Galvaan, 2015: 39; Olsson & Martiny, 2018: 2). A variety of social and cultural factors such as family could affect career development and aspirations (Schultheiss, 2003: 304; Whiston & Keller, 2004: 496; Van Tuijl & Van der Molen, 2016: 161; Miville, Mendez & Louie, 2017: 175) Personality interests, family, school, media, socio-economic and geographic settings have been found to have an impact on the professional aspirations of adolescents (Porfeli, Hartung & Vondracek, 2008: 27; Watson *et al.*, 2011: 413; Albien & Naidoo, 2017).

Owing to South Africa's sociopolitical history, the process of career development is quite challenging (Watson *et al.*, 2011: 413). Socio-economic inequalities have been found to relate with gender, education and employment, and influence career development research, theories, and practice. Watson *et al*. (2011) identified a connection between the influence of parents on the vocational aspirations of children and the occupations of parents. Mouton, Louw and Strydom (2013) observed that school children display an unsatisfactory low progression rate, with children from low socioeconomic backgrounds, whose parents possess meagre educational qualifications being the most disadvantaged.

Gender has been identified as an influential factor in career choice behaviour, and such indicates that different trajectories may exist regarding gender stereotypes and career choice process for men and women (Degol *et al*., 2018: 976; Rocha & Van Praag, 2020: 842). The influence of society on children's career development emerges from gender-role stereotyping of career aspirations and emanates from social influences (Walton *et al*., 2011: 414; Shapiro *et al*., 2015: 5; Olsson & Martiny, 2018: 3). Numerous studies have been conducted to examine the stereotypical beliefs on career choice in male-dominated occupations and have hypothesized that the underrepresentation of women in the construction industry is due to gender-stereotyping of careers (Hadjar & Aeschlimann, 2015: 26; Banchefsky & Park, 2018: 2).

Likewise, studies have identified a range of sociocultural motives on gendered differences in male-dominated environments (Madikizela & Haupt, 2010; Enshassi & Mohammaden, 2012; Akinlolu & Haupt, 2019). Perceptions on the suitable occupations for women in the labour market and the inappropriateness of women undertaking careers in male-dominated fields are commonly cited barriers (Ahuja & Kumari, 2012: 57; Lekchiri & Kamm, 2020: 577; O'Connell & McKinnon, 2021). Gender stereotypes have been found to contribute to the gender imbalance in the industry, which consequently has made construction an undesirable choice for many women (Navarro-Astor, Román-Onsalo & Infante-Perea, 2017: 202). Misconceptions about construction and the influence of social and environmental factors have led women to perceive negative stereotypes regarding their abilities to perform in the industry (Charity-Leeke, 2012: 40). It is, therefore, important to examine the relationship between gender stereotypes and career choice behaviour.

Numerous studies have explored career choices in other non-traditional and male-dominated environments (Shapiro *et al*., 2009; Wells, Delgado-Romero & Shelton, 2010; Akinlolu & Haupt, 2020; Panteli &Urquhart, 2022; Anwar & Khan, 2021), but few have specifically focused on the construction industry in the South African context, where the experiences of people may differ because of various sociocultural influences. Findings from previous studies suggest that demography and ethnic differences may have an impact on career choice and perceptions of career-related barriers. Although there have been numerous studies on gender issues in the construction industry (Chileshe & Haupt, 2010; English & Hay, 2015; Enshassi & Mohammaden, 2012; Rosa *et al*., 2017; Vainikolo, 2017), fewer studies have focused on inter-group differences (Holvino, 2010). This study aims to measure the effect of person variables such as gender and socio-economic status (SES) on how gender stereotypes influence student's career choices in the construction industry.

2. LITERATURE REVIEW

2.1 Career choice

A career is a major predictor of a person's wealth, income, status, nature of work, and lifestyle (Kazi & Akhlaq, 2017: 187). A wrong career choice can lead to failure and disappointment (Bubić & Ivanišević, 2016: 499). Career choice and development is important because it has consequences for socio-economic equalities and mobility (Kim, Ahn & Fouad, 2016: 515). Overtime, the complexity of the career choice process has increased significantly. People are more likely to describe their career choice as a unique interaction between their development phases and environmental circumstances (Kunnen, 2013). Typically, young people are required to undergo a process of understanding, defining, and exploring different career options with the aid of career guidance and planning (Polenova *et al*., 2018: 53; Bubić & Ivanišević, 2016: 499). Proper career planning results in fulfilment, affirms a person's unique identity, and promotes job satisfaction and well-being.

2.2 Gender stereotypes and gender roles

Gender stereotypes are conceptions commonly held by society that attribute a set of characteristics, skills, and behaviour to men and women, indicating that what is masculine is feminine and vice versa (Makarova, Aeschlimann & Herzog, 2016: 2). Shelley, Morabito and Tobin-Gurley (2011: 352) stated that gender role stereotypes are institutionalized when authorities and individuals in a society share a collective opinion concerning roles suited for men and women. As part of a societal belief system, stereotypes are descriptive and prescriptive (Koenig, 2018: 1). The descriptive component of gender stereotypes uncovers how men and women behave and are usually perceived, while the prescriptive element reveals what men and women ought to be and, more importantly, what they ought not to be (Hentschel, Heilman & Peus, 2019: 2). Koenig (2018) argued that descriptive and prescriptive stereotypes are not different from one another; instead, there is an intersection between them, with a direct relation between prescribed behaviours and positive characteristics that describe each gender. These stereotypical beliefs are considerably moulded from sociocultural expectations, which include perceptions of males and females and their occupational roles (Makarova *et al.*, 2016: 4). Socialization facilitated by parents, teachers, peers, and media during childhood through adolescence promotes gender stereotyping (Francis, 2017: 255). Gender stereotypes stem from an individual's observation and perception of daily activities of a particular group and the perceiver's belief that the personal attributes and capabilities required to conduct a task are typical of that group (Hentschel *et al.*, 2019: 1).

Associated with stereotypical societal roles, men are expected to have higher power and occupy senior work positions, while women take up domestic roles and have a lesser status in society (Makarova *et al.*, 2016: 4). An example of such instances is when women are perceived to possess domestic skills, while men are considered to have mechanical skills (Kornrich & Ruppanner, 2021:11887). Szelényi, Denson and Inkelas (2013) indicated that stereotypical beliefs emphasize the communality of women and the agency of men. Men are believed to be self-asserted and dominant, while women are attributed with qualities of selflessness, empathy, and emotions. Although it is flattering that women are perceived as warm, supportive, and kind, these stereotypes may also undermine their abilities and competence (Szelényi *et al.*, 2013). Rudman and Glick (2001) opined that, most of the time, perceptions of empathy and the proficiency of social groups are inversely connected and that practices of sexism that perceive women as warm but not competent, serve to promote gender inequality. Therefore, these assumptions confirm that gender stereotypes are assigned by gender and are universal unfounded generalizations targeted to specific groups, resulting in a basis for the inaccuracy (Saucerman & Vasquez, 2014: 46).

2.3 Gender stereotypes and career choices in construction

Historically, in South Africa, women were at the centre of discriminatory laws that favoured men and were confronted with the burden of unwaged labour (Haupt & Fester, 2012: 56; Makarova *et al*., 2016: 3). An inflexible and obdurate arrangement of working conditions and poor maternity rights prevented them from performing well, bearing in mind that they require breaks for childcare and family responsibilities (Vainikolo, 2017: 26). These responsibilities often deny them the opportunity to undertake full-time paid employment (Ibáñez, 2017: 41). Reports from the International Labour Organization (ILO) initiated the start of research on gender inequality, poor working conditions experienced by women, and barriers to entry in the construction industry (Charity-Leeke, 2012: 45). Therefore, construction research focusing on women post-1980 concentrated on women in developing countries and the bulk of the studies in the construction industry remains focused on developing countries, as gender issues are comparatively more severe in these countries (Vainikolo, 2017: 26).

Studies have found a link between gender stereotypes and work opportunities concerning career choices and expectations (Madikizela & Haupt, 2010; Atalay & Doan, 2020). Events and experiences that occur during childhood could influence an individual later in life (Watson *et al*., 2011: 415). Early childhood interaction enables and teaches young men

to master their environment, while young women learn to seek help and protection (Moodley, 2012: 23; Enshassi & Mohammaden, 2012: 3). Madikizela and Haupt (2010) confirmed that young people begin to make career decisions by the age of 16 and that gender-based career stereotyping hinders the ability for young girls to make career choices or take contrary career decisions in opposition to the will of their parents. English and Hay (2015) revealed that, although many parents were reluctant to encourage their daughters to take up a profession in construction, they showed no hesitance in allowing their sons to enter the construction industry. These findings offer explanations for the lack of consideration that many capable women give to construction-related careers.

Women's participation in the construction industry breaks gender stereotypes and promotes the empowerment of women, by ensuring a rationale for sustainable sources of income (Gupta *et al*., 2009: 399; Moodley, 2012: 23). Although some progress has been made with attracting women into the construction industry, since the industry begun to establish initiatives targeted to increase the representation of women within the sector, their involvement and participation remains relatively low (Worrall *et al*., 2010: 270; Aneke, Derera & Bomani, 2017: 38; Vainikolo, 2017: 28; Alves & English, 2018: 582). Gender-based barriers continue to be a problem in the recruitment and retention of women in the construction industry (Charity-Leeke, 2012). The South African construction industry is the third most predominantly male sector and demonstrates extreme discrimination in the recruitment of women (Navarro-Astor *et al*., 2017: 202).

2.4 Gender stereotypes and participation in the construction industry

Literature has indicated that women do not take up careers in construction for several reasons (Wangle, 2009; Rosa *et al*., 2017). Heteronormative gender stereotyping is evident through men's perception of women's capabilities (Wright, 2014: 985; Vainikolo, 2017: 25). Embedded social and cultural beliefs regarding construction work have reinforced the perception that women are unsuitable and unable to handle the heavy workload in the industry (Adeyemi *et al*., 2006: 567; Wangle, 2009: 35; Francis, 2017: 255; Vainikolo, 2017: 26). Womens' lack of interest in construction has been attributed to socially developed divisions in male-dominated occupations. The treatments, to which women, who enter these professions, are subjected by their male counterparts, affect their choices relating to flexible work hours and balancing childcare (Moccio, 2006: 6; Mangaroo-Pillay & Botha, 2020: 477). Along with men's perceptions regarding women's unsuitability for construction work, maternal profiling creates doubts about

women's abilities (Saucerman & Vasquez, 2014: 45; Sassler *et al*., 2017: 193). This mindset intensifies gender disparities and puts women at a constant disadvantage (Mangaroo-Pillay & Botha, 2020: 477).

Several studies revealed that women are often discouraged from undertaking careers in the construction industry by informal recruitment processes, advertisements, and promotional materials with content that reflects masculine qualities and interests, unfair selection measures, and chauvinist demeanours (English & LeJeune, 2012: 145; Moodley, 2012; Kolade & Kehinde, 2013: 77; Othman & Jaafar, 2013: 277; Makarova *et al*., 2016: 3). Empirical evidence shows that the existence of gender inequality in the construction industry affects the recruitment, retention, and advancement of women and is primarily attributed to social and structural barriers (Sang & Powell, 2012: 239). Women, especially Black women, who were employed in the construction industry, identified problems such as women hindering the progress of other women, female managers achieving their real potential due to patriarchy, lack of role models, and lack of confidence (Suraj-Narayan, 2010: 234; Mgcotyelwa, 2013).

In a study conducted by McDonald (2011: 325), the culture of the industry was identified as a predominant barrier to the recruitment and retention of men and women. Although significant for both genders, the culture of the sector was found to be principally a significant barrier for women. Discriminatory behaviours towards women include the belief that women are unsuitable to occupy executive positions, since the model of an ideal manager is based on masculine qualities (Makarova *et al*., 2016: 4). Women have to circumnavigate common issues such as discriminatory attitudes perpetrated by the dominant male management and adversarial business relationships (Worrall *et al*., 2010; Haupt & Fester, 2012: 54). Women occupy supporting roles involving secretarial, clerical, and administrative duties which are linked to society's stereotypical beliefs that recognize women as nurturers (Arditi, Gluch & Holmdahl, 2013: 981; Kaewsri & Tongthong, 2013: 291; Wright, 2014: 986; Francis, 2017: 254). This implies that women listen actively and use discretion in decision-making and problem-solving (Vainikolo, 2017: 25). Meanwhile, men's roles consist of managerial duties and tasks that involve strength and lifting heavy tools (Kaewsri & Tongthong, 2013: 291). These gendered roles are assigned from the assumption that each gender possesses a distinct set of skills (Vainikolo, 2017: 25). Numerous studies have shown that women who look to pursue careers in the construction industry either have to behave like men to be successful, leave if they cannot adapt to the masculine culture, or maintain their feminine attitudes to occupy minor positions (English & LeJeune, 2012; Haupt & Fester, 2012; Moodley, 2012; English & Hay, 2015: 147; Vainikolo, 2017: 26).

2.5 Gender stereotypes, academic choices, and societal expectations

In line with gender stereotypes, several influences within the educational environment and societal expectations have been found to pressure girls and women to conform to standards of femininity and circumnavigate male-dominated careers (Esteban-Gonzalo *et al*., 2020: 1370). Consequently, women ultimately acknowledge professions such as nursing and teaching as progressively feminine. On the other hand, disciplines such as engineering are perceived as masculine (Sangweni, 2015: 25). Women steer away from socially unacceptable professions because of adverse reactions from family members and employers (Haupt & Fester, 2012: 54). A survey of female construction students found that over 50% of the respondents indicated that their family and friends influence their career decisions (Jimoh *et al*., 2016). An investigation of the influence of parental attitudes on the career decisions revealed that mothers often expect their sons to outdo their daughters in science- and engineering-related subjects and their daughters to surpass their sons in social and art-related subjects (Wang & Degol, 2017: 121; Jacobs, Ahmad & Sax, 2017: 2). The studies further revealed that girls whose mothers held these perceptions performed poorly in mathematics and physics subjects as opposed to their performance in English and geography. Girls who undertake studies in science and engineering fields were found to be disfavoured by both male and female teachers, while boys were given preference and expected to outperform the girls (Chileshe & Haupt, 2010: 222; O'Donnell *et al*., 2015: 38; Lavy & Sand, 2018: 265).

3. MATERIALS AND METHODS

3.1 Research design

Using a quantitative survey research design, this study aims to measure the effect of person variables such as gender and socio-economic status on how gender stereotypes influence students' perceptions of career choices in the construction industry. Quantitative research uses statistics and numbers in the analysis (descriptive and inferential) (Denis, 2019: 19, 41) and interpretation of findings that are generalised from the sample to the population (Creswell, 2014: 11; Bless, Higson-Smith & Sithole, 2018: 16). It allows for using structured questionnaire surveys to measure objectives by counting and the use of several scales (Bless *et al*., 2018: 16). For this study, ten gender stereotypes statements (see Table 3) were set to measure and rank the influence of gender stereotypes on career choice. Exploratory Factor Analysis (EFA) was used to test the reliability and validity of the gender stereotypes construct (Yong & Pearce, 2013: 80). For analysis,

univariate (mean score and frequency), multivariate (Mann-Whitney U and Kruskal Wallis) and bivariate (Pearson's *chi*-square) tests were adopted because the study considered several research variables (Hair *et al*., 2010: 82). Results from these tests were used to test for significant differences between men and women and among socio-economic groups and assess the relationship between gender stereotypes and the career choices among students enrolled in construction-related programmes.

3.2 Population, sample, and response rate

During the time of the study (2021), 461 undergraduate students were enrolled in construction-related undergraduate programmes in two higher education institutions in the KwaZulu-Natal province of South Africa. Conveniently sampling, that is a non-probability sampling method (Saunders, Lewis & Thornhill, 2009), was used to select 461 study participants, from this population of first- to fourth-year students enrolled in programmes such as land surveying, architecture, quantity surveying, civil engineering, and building. Convenience sampling was preferred because it saves time and it is economical to select participants from institutions that are closest to the researcher and more convenient to access (Sekaran & Bougie, 2010: 50). Because of the lack of probability sampling, there is no intention of generalizing the results of this study to a population of all students in South Africa. The sample size table, compiled by Krejcie and Morgan (1970: 608), recommends a sample size of 210 for a population of 460. This recommendation validates the sample size of 461 as excellent for the population of 461. From the sample of 461, 229 participants completed and returned the survey responses, resulting in a response rate of 50%. According to Moyo and Crafford (2010: 68), contemporary built-environment survey response rates range between 7% and 40%, in general.

3.3 Data collection

The survey questionnaire was administered for five weeks from December 2020 to January 2021. The questionnaire was designed using Google forms and administered electronically by sending out hyperlinks to the questionnaire via email and the WhatsApp platform. The first section of the questionnaire inquired about the gender, year, programme of study, and socio-economic status of the participants. The second section was a set of 10 Likert-scale items on the construct gender stereotypes (extracted from reviews from the literature) (see Table 3). Respondents were required to indicate their level of agreement, to examine if gender stereotypes influence career choices in the construction industry. The data from the measurements in section 2 forms the variables used in the EFA, which tested the validity and reliability of the factors. To reduce the respondent's

bias, closed-ended questions were preferred for section two (Stockemer, 2019: 42). Gatekeeper's permission was obtained from the participating universities before the survey of the students. The questionnaire was administered to the study sample, along with a consent form stating the purpose of the research, and the implications of participation in the study. Consenting participants were guaranteed complete confidentiality in the treatment of their responses, as no names of participants were requested in the questionnaire and all other personal information such as phone numbers and email addresses were omitted in the data analysis.

3.4 Data analysis and interpretation of the findings

The Statistical Package for Social Science (SPSS) version 27 was used to analyse the gender stereotypes and measure them against socio-demographic variables, by using descriptive and inferential statistics (George & Mallery, 2021: 112, 161).

3.4.1 Descriptive analysis

For descriptive analysis, the frequencies and percentages of responses were generated and reported, to analyse the respondents' socio-demographic profile. 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. Weightings were assigned to each measure under occupation and qualification. The weightings were then used to group the respondents into high, medium, and low SES categories. Values less than 3 were assigned to low SES, while those less than 6 but greater than 3 were assigned to medium SES categories. Finally, values greater than 6 were assigned to high SES categories.

The mean score (MS) ratings were used to rank the level of agreement on how the ten statements on gender stereotypes affect respondents' career choices. According to Leedy & Ormrod (2010: 185), Likert-type or frequency scales use fixed choice response formats and are designed to measure opinions. For the purpose of analysis, the ranges relative to the MS are defined as follows: 1 = Strongly disagree (≥1.00 to ≤1.49); 2 = Disagree (≥1.50 to ≤2.49); 3 = Neutral (≥2.50 to ≤3.49); 4 = Agree (≥3.50 to ≤4.49), and 5 = Strongly agree (≥4.50 to ≤5.00).

In determining the internal reliability of the gender stereotypes scale, Cronbach's *alpha* values were determined in line with Taber (2018: 1279), who stated that the acceptable Cronbach's *alpha* values range from 0.70 to 0.95. In the current study, a cut-off value of 0.70 was preferred.

To determine the normality of the data gathered, the Shapiro-Wilk test was adopted. The Shapiro-Wilk test makes comparisons between the scores obtained from a sample to normally distributed score sets with the same mean and standard deviation. A non-significant test result, namely the test significance is greater than .05, means that the difference is insignificantly different from a normal distribution, therefore indicating normality (Pallant, 2021).

3.4.2 Factor analysis

In a factor analysis, the optimal inter-item correlations mean (factor loadings) should range from 0.2 to 0.4, for the factor to be reliable (Pallant, 2021: 188), and, in the current study, a value of 0.4 and above was adopted. The Bartlett's Test of Sphericity, and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test were used to assess the data's factor suitability (Pallant, 2021). Factor analysis is deemed appropriate when the value of the KMO test is higher than the acceptable minimum limit of 0.6 and a limit of 1 (Pallant, 2021; Tabachnick & Fidell, 2013: 482). A statistically significant Bartlett test ($p<0.05$) indicates that sufficient correlations exist between the items in the construct to continue with the analysis (Hair et al., 2010: 110; Field, 2013: 38; Pallant, 2021: 190).

For factor extraction, Maximum likelihood and Promax with Kaiser Normalization rotation (oblique - correlated) was used to calculate population values for factor loadings that maximize the likelihood of sampling the observed correlation matrix from a population (Pallant, 2021). As each factor is extracted, the maximum likelihood analysis statistically tests the significance. Item communalities between 0.25 and 0.4 have been suggested as acceptable cut-off values, and for this study 0.3 was adopted (Beavers *et al*., 2013: 3). The Kaiser's criterion or the eigenvalue rule was adopted to determine the number of factors to retain (Pallant, 2021; Tabachnick & Fidell, 2013: 38). Eigenvalues greater than 1 were considered significant and retained (Laher, 2010; Matsunaga, 2010: 100).

By conducting a correlation analysis, relationships between an item and another were measured (Pallant, 2021). The value of correlation co-efficient ranges from -1.00 to +1.00. A correlation coefficient of 0 indicates no relationship between the variable in question. The closer the coefficient is to 1.00 (positive or negative), the stronger the relationship. To indicate discriminant validity, correlation coefficients should be above the cut-off value of 0.30 and less than 0.90 (Kline, 2015).

3.4.3 Inferential analysis

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 gender stereotypes and career choices. The study adopted the Mann-Whitney U test to test for significant differences between the gender groups and used the Kruskal-Wallis test for significant differences between the SES groups. The Dunn-Bonferroni post-hoc test was conducted to determine where the significant differences lie between the SES groups. A p-value of 0.05 or less indicates a significant difference between groups. The Pearson's chi-square test was used to test for any significant relationship between gender stereotypes and career choices. The parameter estimate is significant at $p \leq 0.05$.

4. RESULTS

4.1 Respondents' profile

Table 1 shows an almost equal distribution between men (50.7%) and women (49.3%) in the sample. First-year students had the largest number of participants, with 94 students (41%), followed by second-year students at 87 (38%). This rate of participation is possible because the first-year cohort of students at South African Universities is usually larger than the later years or more advanced levels of study. The distribution shows that Construction Management (48%), Quantity Surveying (21.8%), and Building (20.5%) were the best represented study programme groups. Architecture represented the lowest number of students (n=1; 0.4%) in the sample because only one of the universities offered the programme and typically had fewer numbers of students compared to the other disciplines and programmes. Table 2 shows that, based on the occupation and the highest qualification of the breadwinner of the household, 133 (58.1%) of the students were categorized to be of low socio-economic status.

Table 1: Demographic distribution

Demographic	*Category*	*Frequency (n = 229)*	*%*
Gender	Men	116	50.7
	Women	113	49.3
Year of study	1st	94	41.0
	2nd	87	38.0
	3rd	30	13.1
	4th	18	7.9

Demographic	*Category*	*Frequency (n = 229)*	*%*
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

Table 2: Socio-economic background

Characteristic	*Category*	*Frequency (n = 229)*	*%*
Occupation of the breadwinner of the household	Unskilled	161	70.3
	Skilled	21	9.2
	Graduate	39	17.0
	Specialist	8	3.5
Highest qualification of the breadwinner of the household	Post-Matric	59	25.7
	Matric	54	23.7
	High School	59	25.7
	Primary School	57	24.9
Socio-economic status	High SES	42	18.3
	Medium SES	54	23.6
	Low SES	133	58.1

4.2 Ranking gender stereotypes based on career choice

Table 3 ranks the gender stereotypes influencing the career choices in the construction industry. The Cronbach's *alpha* value was greater than 0.80 at 0.939, indicating acceptable internal reliability of the factors, as recommended by Taber (2018: 1279). With an average MS of 2.39, the respondents disagreed that gender stereotypes influence career choices in the construction industry, except for work abilities, and harder work as counterparts, that were rated as neutral. The Shapiro-Wilk test indicated a non-normal distribution at p=0.000 (significant p>.05) for all the variables. Maximum likelihood estimation with robust standard errors and *chi*-square was employed to account for the non-normal distribution of data.

Table 3: Descriptive statistics – Gender stereotypes

Statement	*Descriptive statistics (n = 229) Cronbach's alpha 0.939*			*Shapiro-Wilk 0.000*	
	MS	*Rank*	*Remark*	*Value*	*P-value Sig.*
Because of my gender, people will believe I possess lesser abilities in my work	2.70	1	Neutral	.882	0.000
Because of my gender, I will have to work twice as hard as my counterparts	2.68	2	Neutral	.881	0.000
Because of my gender, I will be expected to do administrative work	2.21	3	Disagree	.831	0.000
Because of my gender, I will have to occupy a junior position at work	2.18	4=	Disagree	.834	0.000
Because of my gender, I will be expected to possess domestic skills rather than technical skills	2.18	4=	Disagree	.794	0.000
Because of my gender, I will be expected to choose a career different from the one I prefer	2.14	5	Disagree	.687	0.000
Because of my gender, I will be expected to have a lesser status in the society	2.13	6	Disagree	.811	0.000
Because of my gender, people will believe I will perform badly in mathematics and science subjects	1.96	7	Disagree	.761	0.000
Because of my gender, I will be expected to have a low level of education	1.93	8	Disagree	.757	0.000
Because of my gender, I will earn a lower salary than my counterparts for similar work	1.90	9	Disagree	.754	0.000
Average MS (composite score)	2.39		Disagree		

Significant at p>.05

4.3 Exploratory factor analysis

Ten items of the gender stereotypes construct with communalities loadings of 0.4 and above were subjected to EFA. The KMO for gender stereotypes was 0.931, which is greater than 0.70, and a significant Bartlett's test of Sphericity with p<0.000 was obtained, as shown in Table 4. The results meet the criteria for factor analysability.

Table 4: KMO and Bartlett's test for gender stereotypes

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.931
Bartlett's Test of Sphericity	Approx. Chi-Square	1943.421
	Df	45
	Sig.	.000

From the results presented in Table 5, one factor with an eigenvalue of 6.634 accounted for 66% of the variance. The factor analysis results suggest that one factor may be adequate to represent all the data for the construct gender stereotypes and are, therefore, considered unidimensional and adequate evidence of convergent and discriminant validity.

Table 5: Initial eigenvalues for gender stereotypes

Factor	*Initial eigen values*		
	Total	*% of variance*	*Cumulative %*
1	6.634	66.336	66.336
2	.792	7.917	74.253
3	.678	6.775	81.028
4	.479	4.793	85.821
5	.358	3.578	89.399
6	.310	3.103	92.502
7	.260	2.602	95.104
8	.253	2.526	97.630
9	.139	1.390	99.020
10	.098	.980	100.000

The corrected item-total correlation values were greater than the recommended cut-off value of 0.3, indicating that the items were a good measure of the construct. The factor loadings for all items were greater than 0.40, shown in Table 6, and the communalities values of 0.3 and above for the items were all acceptable. This indicates that all factors are statistically valid to represent the construct. Three items (GST4, GST5, GST6) had loadings above 0.900.

Table 6: Gender stereotypes factor statistics

Item	Factor	Factor loading	Corrected item-total correlation	Communalities	
				Initial	Extraction
GST1	Because of my gender, people will believe I possess lesser abilities in my work	.556	.569	.404	.309
GST2	Because of my gender, I will have to work twice as hard as my counterparts	.654	.653	.512	.428
GST3	Because of my gender, I will have to occupy a junior position at work	.804	.773	.678	.647
GST4	Because of my gender, I will be expected to do administrative work	.902	.851	.801	.813
GST5	Because of my gender, I will be expected to have a lesser status in society	.926	.865	.840	.857
GST6	Because of my gender, I will be expected to possess domestic skills rather than technical skills	.942	.885	.859	.888
GST7	Because of my gender, I will be expected to have a low level of education	.806	.790	.695	.649
GST8	Because of my gender, I will be expected to choose a career different from the one I prefer	.683	.692	.534	.467
GST9	Because of my gender, people will believe I will perform badly in mathematics and science subjects	.742	.748	.631	.550
GST10	Because of my gender, I will earn a lower salary than my counterparts for similar work	.798	.776	.650	.637

Extraction Method: Maximum Likelihood Rotation Method: Promax with Kaiser Normalization

As indicated in Table 7, almost all items have positive and high correlation with each other ranging from r=.412 for GST1 and GST3 to r=.887 for GST5 and GST6. Due to relative high correlations between items, with correlation values above 0.30 and less than 0.90, the ten items in the gender stereotypes scale would be good for factor analysis as all the construct items fulfil the requirement for convergent validity (that is constructs that are expected to be related are, in fact, related).

Table 7: Correlation coefficient for gender stereotypes

Item	*GST1*	*GST2*	*GST3*	*GST4*	*GST5*	*GST6*	*GST7*	*GST8*	*GST9*	*GST10*
GST1	1.000									
GST2	.541	1.000								
GST3	.412	.624	1.000							
GST4	.488	.606	.755	1.000						
GST5	.515	.590	.769	.847	1.000					
GST6	.503	.607	.725	.861	.887	1.000				
GST7	.414	.484	.630	.674	.722	.769	1.000			
GST8	.431	.463	.551	.622	.569	.621	.658	1.000		
GST9	.503	.449	.539	.619	.653	.691	.712	.620	1.000	
GST10	.439	.467	.652	.697	.727	.740	.697	.579	.692	1.000

4.4 Inferential analysis

4.4.1 Multivariate analysis to assess gender differences

The Mann-Whitney U test was conducted to test for significant differences between men and women, with regards to the influence of gender stereotypes. Table 8 shows the mean scores for the career choice predictor, and the rank order for men and women.

Table 8: Test statistics for gender and gender stereotypes

Career choice predictor	*Gender MIS*		*Mann-Whitney U*	
	Men	*Women*	*Z-value*	*Sig.*
Gender stereotypes	24.03	27.07	4.000	0.000*

*Significant at p≤.05

On the gender stereotype construct, men reported a mean score of 24.03, while women reported 27.64. This indicates that women perceived gender stereotypes to have a slightly higher influence on their career choices, compared to their male counterparts. The Z-value and the Sig. value obtained from the Mann-Whitney U test were also presented. Significant differences between the two groups were found, indicating that men and women perceived the influence of gender stereotypes differently, based on their gender (z=4.000, p=.000) as the Sig. values were less than the cut-off value of 0.05.

Table 9 presents further assessment of each of the gender stereotype variables. Both men and women perceived that occupying a junior position at work (z=.504, p=.614) or doing administrative work (z=2.560, p=.100) had no influence on their career choices in the construction industry. There were significant differences in the perception of men and women for GST1, GST2, GST5, GST6, GST7, GST8, GST9 and GST10. Women perceived that possessing lesser abilities in work (z=6.657, p=.000), working twice as hard as counterparts (z=8.830, p=.000), having a lesser status in society (z=2.680, p=.007), possessing domestic skills rather than technical skills (z=2.709, p=.007), having a low level of education (z=2.934, p=.001), expectations to choose a career other than the preferred one (z=3.284, p=.001), performing badly in mathematics and science subjects (z=3.138, p=.002), and earning a lower salary than counterparts for the same work (z=2.397, p=.017) had a higher influence on their career choices in the construction industry compared to men.

Table 9: Gender differences: Further analysis for gender stereotypes

Item	*Factors*	*MIS*		*Mann-Whitney U*	
		Men	*Women*	*Z-value*	*P-value Sig.*
GST1	Because of my gender, people will believe I possess lesser abilities in my work	86.92	143.82	6.657	0.000*
GST2	Because of my gender, I will have to work twice as hard as my counterparts	98.84	131.58	8.830	0.000*
GST3	Because of my gender, I will have to occupy a junior position at work	112.92	117.14	0.504	0.614
GST4	Because of my gender, I will be expected to do administrative work	104.41	125.84	2.560	0.100
GST5	Because of my gender, I will be expected to have a lesser status in society	103.98	126.31	2.680	0.007*
GST6	Because of my gender, I will be expected to possess domestic skills rather than technical skills	103.92	126.37	2.709	0.007*
GST7	Because of my gender, I will be expected to have a low level of education	103.31	127.00	2.934	0.003*
GST8	Because of my gender, I will be expected to choose a career different from the one I prefer	101.78	128.57	3.284	0.001*
GST9	Because of my gender, people will believe I will perform badly in mathematics and science subjects	102.39	127.95	3.138	0.002*
GST10	Because of my gender, I will earn a lower salary than my counterparts for similar work	105.47	124.78	2.397	0.017*

*Significant at p≤.05

4.4.2 Multivariate analysis to assess SES differences

The Kruskal Wallis test was conducted to test for significant differences in the influence of the career choice predictors between the SES groups. Table 10 shows that significant differences were found for gender stereotypes (Chi-square =9.228, p=.010) as the Sig. values were less than the alpha value of 0.05. The mean score for the high SES was 26.23, the medium SES group was 20.09, and the low SES was 29.56. This result indicates that, compared to the other groups, the students from low socio-economic backgrounds found gender stereotypes to have a higher influence on their career choices in construction.

Table 10: Test statistics for SES and gender stereotypes

Career choice predictor	*High SES*	*Medium SES*	*Low SES*	*Kruskal-Wallis*		
	MIS	*MIS*	*MIS*	*Test Static*	*Df*	*Sig.*
Gender stereotypes	26.23	20.09	29.56	9.228	2	0.010*

*Significant at p≤.05

The results of the Kruskal-Wallis test indicate that there are differences among groups but do not reveal where the differences lie (Field, 2013: 39). The Dunn-Bonferroni post-hoc procedure was adopted in this study to determine where the significant differences lie between the SES groups. The post-hoc test conducts multiple tests and adjusts the p-values by multiplying each p-value by the total number of tests performed. The Bonferroni error correction produces the Adj Sig. value which adjusts for multiple testing. As shown in Table 11, perceptions from the low SES group (p<.015) were significantly different from the medium SES group (p<.020).

Table 11: Analysis of Dunn-Bonferroni test

Career choice predictor	*Groups*	*Test Static*	*Std. Error*	*Adj. Sig.*
Gender stereotypes	High-Low SES	6.531	10.668	1.000
	High-Medium SES	-38.234	13.602	0.015*
	Low-Medium SES	-31.703	11.702	0.020*

*Significant at p≤.05

4.4.3 Bivariate analysis of relationship between gender stereotypes and career choice

The Pearson's chi-square test was used to test for any significant relationship between gender stereotypes and career choices. Gender stereotypes were hypothesized to have a relationship and direct influence on career choice. The results in Table 12 show the standardised regression relationship. The value of R2 was 0.518, and the p-value was 0.000, indicating statistical significance as the p-value was less than 0.50. This result shows that gender stereotypes have a positive relationship and direct influence on students' career choices in the construction industry.

Table 12: Testing direct influence of gender stereotypes on career choice

	Relationship		*Regression estimate*	*P*
Proposed hypothesis	CRC	GSP	0.518	0.00*

CRC = Career Choice; GSP = Gender Stereotypes

*Significant at p≤0.05

5. DISCUSSION

With reference to the perception of men and women on how gender stereotypes influence their career choices, a statistically significant difference was found for the influence of gender stereotypes for men and women. The results illustrated that there are differences between men and women with regards to gender stereotypes and career choice in construction. As shown by the mean scores obtained, the women in this study perceived their career choices to be influenced by gender stereotypes more than the men. Overall, this result is consistent with findings from previous research, indicating that gender stereotypes influence the career choices of men and women differently.

Previous research provides evidence that men and women differ in their perception of gender stereotypes (Betz & Hackett, 2006; Eccles, 2011; Su & Rounds, 2015). Serra et al. (2019) found that there was a higher likelihood for female students than male students to choose careers traditionally associated with their gender. Evidence from literature examining gender stereotyping and the differences in career choice behaviour reveals that gender differences are due to gender role socialization (Malach-Pines & Kaspi-Baruch, 2008; Wilmuth, 2016; Solbes-Canales, Valverde-Montesino & Herranz-Hernández, 2022). Generally, masculine behaviours are socially preferred (Ezzedeen, Budworth & Baker, 2015: 360). Stereotypically, feminine traits such as gentleness and kindness have been attributed to weakness and are less valued in professions such as construction (Olsson & Martiny, 2018; Makarova, Aeschlimann & Herzog, 2019). The extent to which the decision of men and women to undertake careers in construction are influenced by gender stereotypes and certain stereotypical masculine characteristics are commonly ascribed to men, which are not attributed to women. Similarly, women held stereotypes about themselves that expected them to possess less masculine attributes and assumed stereotypical feminine supportive roles. Differences in the perceptions of men and women regarding gender stereotypes were found to be largely as result of how the men perceived women (Akinlolu & Haupt, 2019; Oo, Liu & Lim, 2022; Tapia et al., 2020:813). Consistent with these findings, it has been noted that gender stereotypes, through how men perceive women in the construction, may impact women's decisions to undertake a career in construction (Watts, 2009; Wright, 2014; Francis, 2017; Opoku & Williams, 2018).

A statistically significant difference was found among the SES groups for gender stereotypes, therefore lending support to the assumption that SES differences exist for the influence of gender stereotypes on career choices in construction. Poor performance and a low participation rate in construction-related professions has been reported for students of minority

and lower SES groups, resulting from gender stereotypes, which are accumulated during the socialization process, and is a major determining factor in making career choices (Bécares & Priest, 2015; Dicke, Safavian & Eccles, 2019; Oo et al., 2022).

The relationship between gender stereotypes and the career choice in construction was found to be statistically significant. As established in literature, this result demonstrates the powerful role that gender-related stereotypes play in the career choice process of students. Many studies have confirmed that continued gender stereotyping of the construction profession influences career choices in the industry (Kay, Matuszek & Munson, 2015; Rosa et al., 2017; Naoum et al., 2020). Social norms and unconscious biases have been found to reinforce the perception that construction is more appropriate for men than for women (Powell & Sang, 2015). These stereotypes became deeply rooted when girls rarely received encouragements to enter in male-dominated professions (Mujtaba & Reiss, 2013: 2980).

6. CONCLUSION

This study examined the role of gender stereotypes in the career choices of students in construction-related programmes, as well as the perception of gender and SES groups regarding choosing a career in construction, and specifically gender stereotypes as a predictive variable of career choice. The study's findings confirm gender stereotypes as a predictor of career choice, and how gender stereotypes guide students towards careers deemed appropriate to their gender. Findings of the current study have meaningful implication for practice in career choice and development in male-dominated environments and occupations. Addressing the issue of gender role stereotypes within non-traditional environments could serve to empower women to pursue non-traditional professions more confidently and with a better understanding of the barriers to participation.

Although this study sampled men and women from diverse ethnic and socio-economic backgrounds in the KwaZulu-Natal province of South Africa, a generalization of the findings to the entire South African population needs caution. Since the present sample may be described as unique, due to the inclusion of only men and women enrolled in construction-related programmes at two higher education institutions, it is uncertain whether these results may not adequately represent the population of interest and be generalized to a general sample of students at other universities.

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