Gender in the construction industry: literature review and comparative survey of men's and women's perceptions in UK construction consultancies

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Abstract

For more than two decades, construction industry leaders have made attempts to attract more women into professional roles to ease skills shortages and diversify the workforce. However, the number of women working in the industry has not improved significantly. This paper reviews previous literature on gender diversity in the construction industry and disseminates findings from a survey which investigated whether there are significant differences in self-perception between men and women in construction consultancies operating in the United Kingdom (UK). The survey questionnaire was completed by 60 men and 57 women. Analysis of the result confirmed that women tend to follow 'zig-zag' career development paths and that 'global self-worth' of women over the age of 40 is the lowest among all ages. However, little variation was found on initiatives to improve retention of women in construction consultancies. The results reveal that both men and women regarded 'improved flexible working-arrangements', 'transparent promotion criteria', 'return to work training', 'outreach programmes to schools' as the most crucial initiatives to retain women. This reinforces the call for organizations to introduce innovative strategic plan to change the masculine culture of the construction profession and to modernise working practice away from the existing rather outdated traditional structure.

Key words: Gender; Professional Roles; Self-perception

Subject headings

NT: Construction management
NT: Personnel management
NT: Resource management

Introduction

The UK construction industry employs 2.10 million people equating to 6.5 percent of the total workforce. It contributes £103 billion in gross value to the UK economy (Great Britain, Office of National Statistics, 2014). The industry experienced unprecedented growth in the 1990's up until the recession in 2008 which resulted in a widespread skills shortage. This crisis prompted industry leaders to implement new initiatives aimed at easing the skills shortage; one of which was an effort to diversify the workforce with measures being taken to recruit more women into the construction industry (Dainty and Edwards, 2003; Briscoe, 2005).

For the past three decades, there has been an emphasis on improving the construction industry and comprehensive initiatives and programmes have been established to target some of Egan's (1998) and Latham's recommendations (1994). Addressing the gender imbalance in the industry was something that Latham (1994, p. 71) advised. This report recognized the omission of women as a disadvantage to the industry, making it impossible to obtain the best people when half the population is excluded. Despite global recessions, the construction industry is still experiencing a skills shortage throughout all levels from the trades through to office-based staff. The Construction Industry Training Board (CITB) reported that, despite the decreased construction output of recent years, there is still a need to recruit a skilled workforce. The annual recruitment requirement for 2013-2017 was anticipated to be 29,050 (CITB, 2013). Assuming the economy improves over the next few years, construction output will increase elucidating a greater importance to invest in the development and training of an appropriately skilled diverse workforce.

Professional bodies such as the Royal Institution of Chartered Surveyors (RICS) have worked to contribute to the body of knowledge surrounding women in

construction through research, like Raising the Ratio, which was aimed at identifying why women (and men) leave the industry (Ellison and Cowling, 2006). Research performed by Kingston University and funded by the RICS found that women are leaving surveying in greater numbers when they are in their 40s due to a wide range of reasons. The top three reasons cited being: (1) 'hours and conditions inflexible with the need to look after children' (41 %), (2) 'to spend more time with children/family' (39%) and (3) 'restricted career progression and lack of opportunity' (20 %) (Ellison and Cowling, 2006).

On the whole, educational initiatives aimed at increasing the proportion of women studying science and engineering have, to a certain extent, succeeded (Powell *et al.* 2005). However, this increase in female engineering and construction graduates does not equate to more female professionals in the construction industry; a disparity that has been sparsely researched. Over a 10-year period, the proportion of female students who were studying science, technology, engineering and maths (STEM) subjects increased by 55 percent (compared to 29 percent for male students) and the Equal Opportunities Commission (EOC) reported in 2005 that more women were entering higher education (Gurjao, 2011). Armed with these statistics and targeted initiatives towards women, one would assume that improvements have been made regarding gender diversity. In fact, the opposite is true, as the number of women working in the construction industry has remained relatively stable since the 1990s at between 9 and 12 percent, with the vast majority of roles being administrative and secretarial (Briscoe, 2005; Gurjao, 2011).

Fielden *et al*. (2000) argued that despite many female engineering students, the male-dominated 'sexist' image of the industry will continue to deter women from choosing to work in construction and change will only be realised when a change in

culture is embraced. Lu and Sexton (2010) concede that it is not surprising that past initiatives have been unsuccessful as they fail to acknowledge the complex journey many women currently working in the profession have taken.

This research has acknowledged four main reasons why the industry had failed to tackle the issue of women in construction, these are: (1) the industry failed to take into account the 'zig-zag' career development paths of women defines by 'a dip and rise in self-perceptions of women across all ages' (Frances, 2017; Lu and Sexton, 2010 and Powell *et al.* 2004); (2) the problem is mostly aimed at younger girls and school leavers and did not consider the varied background of many women (Cannon, 2014); (3) previous research did not take into account the differences in perceptions between men and women (Powell *et al.* 2004), despite previous speculation that reviewing the self-perceptions of men who hold the power in most organisations is an important step to improving the body of knowledge on gender diversity (Rumens, 2013); (4) the industry has not come up with a practical and effective strategic plan to prevent women from leaving the industry as they age following the 'leaky pipeline' theory (Morello et al. 2018; Gurjao, 2011; Jenson *et al*. 2005). The 'leaky pipeline' concept attempts to explain why more women choosing to study engineering do not result in more women in the industry and in senior positions, concluding that women are choosing to drop out or leave the industry at different stages of their career (Jensen *et al.* 2005).

Whilst previous research concentrated on finding out the problems and the barriers that influence professional women's career advancement in construction and ways to retain them in the industry, little research has been conducted to understand how women in professional roles perceive themselves at different stages of their career. This paper reports on the state of the art literature review on gender in the construction industry and reveals the finding of a survey that was conducted in the

UK during 2016/17. The survey explored the perceptions of women in construction consultancies, comprising (project managers, architects, engineers and surveyors) and compared them to men's perceptions in the same discipline and age groups. The main aim is to provide more information for senior managers about how women perceive themselves across different stages of their career development and the initiatives that can retain them in the industry. The intention is to offer decision makers at senior levels an opportunity to broaden their horizon towards adopting innovative strategies to human resource management in order to reverse the current trend of underutilisation of female talent in the construction professions.

Literature review

Gender roles and barriers to women in construction

According to social learning theory postulated by Galea and Loosemoore (2006), gender is a self-perceived sense of maleness or femaleness that is learnt through socialisation and education and is socially determined by society's expectations of the roles of men and women. When considering the effect gender has in the construction industry, historically, construction work was a physically demanding job that favoured men. However, social stereotypes and norms play a large role in reinforcing the gendered workforce (Styhre, 2011). The exact role gender theory and perceptions play in the construction industry is often debated and Clarke and Wall (2006) suggested that it has always had an influence in the type of work that is deemed acceptable for women to do in the industry. Even after the World War of 1939-1945, when women replaced the men who normally worked in the trades, women were excluded from the reconstruction projects that were required to rebuild Britain with unskilled men promoted to skilled positions over women regardless of ability (Clarke and Wall, 2006).

The perception of what women can do, based on their gender, is just one barrier to them in the industry. Barriers to construction experienced by women were researched in more depth by Dainty *et al.* (2000) who interviewed 41 matched pairs of males and females working in the industry to compare their careers and progression. The research concluded eight phenomena, which need to be overcome to enable women to progress within the industry. These phenomena were: (1) entrance to the industry; (2) entrance to organizations; (3) context of a career in construction; (4) structural organizational processes; (5) cultural organizational processes; (6) individual characteristics and circumstances as determinants of careers; (7) career strategies; (8) future expectations, opportunities and threats under career progression. Dainty *et al.* (2000) then mapped the vertical career progression of every informant against time from the informants' careers accounts. They found that women were to have progressed an average of one hierarchical level behind their male peers of similar age and experience. Dainty *et al*. (2000) concluded that, all attempts to attract more women should be diluted until structural and cultural changes have been realised.

One of the most widely cited barriers to women entering and working in the construction industry is its 'masculine-culture'. There is a large body of evidence to support the need for structural and cultural change to make construction more accessible and appealing to women. However, while solely relying on culture change as a solution, a number of issues remain. Naoum (2011, p. 145) suggests that the strength of an organisational culture is a result of the 'internalisation' and acceptance of the beliefs and values of the organisation by its members. In the context of the construction industry that is and has historically been, male-dominated, the deep-rooted masculine - culture is perpetuated by the 'internalisation' of the masculine attitudes and ideologies.

Furthermore, as cultural change is influenced by a variety of factors such as organisational characteristics and values, management strategy and leadership, operational and environmental influences, there are no guarantees that changes to policy and structure would result in a positive move towards gender diversity. Powell *et al*. (2010) argued that a greater understanding of gendered stereotypes is essential to work towards innovate initiatives that 'challenge cultural norms and gendered stereotypes among all employees' to ultimately improve gender diversity.

In recent research by Barreto *et al.* (2017), 20 barriers were identified. These barriers composed the statements of the questionnaire survey and the data was obtained from 429 professionals in the Peruvian construction industry. It was found that women face invisible barriers throughout their careers and have fewer professional opportunities than men. The main perceptual dissimilarities between men and women indicate that men interpret womanhood as a form of positive discrimination, which, far from being a professional barrier, is considered an advantage by them. Likewise, women agree that if they take maternity leave, they will suffer a loss in the hierarchical order; furthermore, the industry does not have flexible work schedules, childcare programs, or provisions for career breaks. Five underlying factors were extracted from the analysis: male oriented labour market, detrimental issues for being a woman, harsh working conditions in the construction industry, unfavourable perception of the construction industry, and high competitiveness of the construction industry. Results of Infante-Perea *et al.* (2016) also showed that both men and women perceive job market constraints and inadequate preparation as the two main career barriers.

Well-being and conflict – a gendered difference

Focusing on retention of the women that already work in the construction industry is paramount (Menches and Abraham, 2007). Its well-being and long-term sustainability to assure the 'leaky pipeline' phenomena does not continue (Gurjao, 2011). Equal concern is the inflexible working practices which often lead to problems regarding their work-life balance (Worrall *et al*. 2010). Age is a significant factor in women's desire to continue their career in the construction industry. Recent study by Morello *et al.* (2018) found that women in the 18–24 and over 65 age groups have more frequently expressed an interest in leaving the industry than women between the ages of 25 and 54. Additionally, single women who had not been previously married remain in the industry in greater frequencies than married women.

Research on the well-being of construction professionals has found that burnout and poor work-life balance are commonplace in the industry as it is often driven by time and cost constraints leading to long working hours and stress. Such investigations have sampled the well-being of men, but women's stressors and experiences are not well-documented or researched (Sang *et al. 2004).* The construction industry is linked to stressors like long working hours, job insecurity, poor professional worth, temporary working teams and a poor work-life balance (Sang *et al.* 2007 and Worrall *et al*. 2010).

The well-being of its employees is paramount to the survival of construction consultancy companies because people are their only asset. Styhre (2011) ruminates that traditional masculine ideology embodied in the construction industry perpetuates the paternalistic role of the site manager resulting in burnout, stress and health problems. This is so because the masculine ideologies denote the totality of norms, belief and assumptions that serve to enact specific images of, for example, leadership

work. In the case of the Swedish construction industry, the site manager's role is enacted as a paternal figure having full control of the situation, always in the position to take care of emerging and unforeseen events, and spending long hours at work. Such a site management role is thus reproducing gender ideologies, imposing '*expectations*' on individual site managers, and erecting entry barriers for women or individuals not willing to forsake family life. However, in recent research by George and Loosemore (2018), it was found that the focus of attitudes towards masculinity in the construction industry may be shifting to reflect trends in the wider population and may be more inclusive and less hegemonic than has been previously argued. It is also found that the focus of masculinity in the construction industry is closely related to the physical and high-risk nature of work and that sexuality and humour may also be an important source of masculine identity. These results are important since they contribute a more nuanced understanding of the dimensions and exact nature of attitudes towards masculinity in the construction industry.

Earlier in Australia, an on-line questionnaire survey was conducted to investigate whether women professionals in the construction industry differ from their male colleagues in the stressors faced at work and the degree of work-related psychological injuries suffered (Sunindijo and Kamardeenand 2017). The respondents comprised 167 men and 110 women professionals working in the Australian construction industry. The results reveal that: (1) women professionals suffer more anxiety and acute stress symptoms than male professionals, but no significant difference is apparent between the genders in the level of depression suffered; (2) the top 10 stressors at work facing construction professionals are the same for both genders, with time pressure, excessive workload, long work hours, and unpleasant work

environment being the critical issues; and (3) women professionals experience more discrimination, bullying, and sexual harassment.

Styhre (2011) suggested that a greater understanding of the role gender theory plays would help to benefit all operatives as the negative effects and social costs to the industry go beyond just excluding minorities. The masculinities in the industry can result in a negative impact for men and women and more needs to be done to understand the impact. Understanding the link between gender, communication and the high level of conflict is essential for those looking to attract more women into the construction industry. The communication styles of men tends to be more direct and confrontational as a result of playing in large groups as boys where there is a greater importance on visibility; women are more inclined to have an indirect, less physical style of communication with a tendency to avoid conflict (Galea and Loosemore, 2006). There was a significant relationship between position in a company and a woman's self-identified communication style.

Just as the industry is dominated by masculinities, so is the communication style, with high levels of confrontation followed by appeasement in men-to-men conflict. Interestingly, when females are involved, there are lower levels of escalation of confrontation and aggression (Galea and Loosemore, 2006). In a research by Morello *et al*. (2018), it was found that women who were at higher levels within their career path, such as senior level and executive, perceived themselves as being more dominant in their communication style than those at lower levels. Also, women in the executive level self-identified as being agentic leaders more than those in lower-level positions, while principals and owners more commonly self-identified as being communal.

When looking at the well-being of women, Sang *et al.* (2007) interviewed a number of UK architects and concluded that women showed lower levels of job satisfaction, higher levels of work-life conflict and physical health problems associated with poor well-being like headaches and insomnia than their male counterparts. On the other hand, according to a study by Ortiz *el al* (2015), the majority of women in civil engineering faculties do feel affirmed and valued as employees because all factors resulted in more than 50% of the respondents being very satisfied or satisfied. However, there appear to be changes in perceptions as women progress in their careers and there are interesting variations in how satisfied women in engineering faculties are with different facets of their jobs.

In the USA, the link between job turnover and job satisfaction was explored by Dabke *et al*. (2008). Women were found to be satisfied with the nature of work in construction trades but were less satisfied with pay, benefits, job security, and availability of separate, hygienic sanitary facilities. Co-worker support or treatment was not important to women, and they were satisfied with people on the job. Women who worked outside the local area were more satisfied with the nature of work and the job in general. In further research in the USA by Malone and Issa (2013), it was found that the factor with the most pronounced influence on satisfaction with an employer was whether the respondent had earned a college degree or trade certificate. Respondents with a college degree or a trade certification were more than four and a half times more likely to respond as satisfied with their current employer than those who did not have a degree or certification. Further empirical research is needed to explain the claim that satisfaction among women is associated with the educational level.

Coping strategies and mechanisms

Sheppard (1989) described coping as a strategy of 'blending in and claiming a rightful place'. Such a 'blending' depended on very careful management of being feminine enough in terms of appearance, self-presentation, acceptance of different expectations and of motherhood responsibilities, while at the same time being business-like enough (competent, promotion aspirations), in order to claim a rightful place in the organisation. Arguably, female in engineering studies are aware that they are entering into a male-dominated industry. In a research by Keen and Salvatorelli (2016) into discrepancies between female student perception and the reality of the engineering industry, it was found that students in the engineering industry are prepared for the realities of the profession, including the working hours, compensation in the form of pay, and some benefits, such as health and disability insurance. This being said, there were some areas of fairly large discrepancy between what students anticipate and what is indicated as reality by industry professionals. The most prevalent difference appears in the areas of academic degree attainment, professional engineering licensure and employment benefits, including paid maternity leave, flexible work hours, part-time employment, and leave without pay.

Several studies have been conducted into strategies and mechanisms to overcome both the barriers and ways to cope in male dominated environments such as construction (Watts, 2012; Styhre, 2011; Powell *et al*. 2005; Sang *et al*. 2004 and Dainty, 2000). Women who seek entry into male-dominated cultures either have to act like men in order to be successful, or leave if they are not adaptable to the culture, alternatively, they can remain in the industry without behaving like men but maintaining unimportant positions (Bennett *et al*. 1999). According to Powell *el al.* (2005), previous coping solutions focus attention on the women themselves: they

could for example choose appropriate behaviours, work extra hard, walk the tight rope and balance their gender and professional identities. It can be argued that these strategies are just ‘coping mechanisms’, rather than solutions to the problems women face to challenge the existing culture and structures in engineering.

In an interview with female students conducted by Powell *et al.* (2005) they were asked about their changing behaviour and any coping strategies that they had developed. An interesting comment was “it is actually a case of everyone else getting used to you rather than adjusting your own behaviour.” That interviewee went further to imply that to act ‘too feminine’ might affect how colleagues treat you, "as long as you don’t go out there thinking that you’re going to get special treatment, it’s all fine.”

Other gender stereotype often mentioned in research is that of the ‘queen-bee’ syndrome (Sinclair, 2005 and Whittock, 2002) where women see their status in the industry as a novelty and align themselves more often with male colleagues over female counterparts. This can result in the ‘queen bee’ perceiving other women as weak, for failing to achieve what they have and resisting the entrance of other women for fear of losing their *status quo* (Powell *et al*. 2010). When women perceive other women with a gender bias at a subconscious level, ‘women internalise disparaging cultural attitudes and then echo them back’ making women both the victim and the perpetrator of sexism and gender bias (Sandberg, 2013 p. 165). As this coping mechanism is often used by women on a subconscious level, researchers will only be able to test if frequency of ‘queen-bee’ syndrome decreases with increased gender diversity when more women actually stay in the industry. Previous research showed that women experience increased visibility in the industry, resulting in the pressure to over-perform which is the basis of the ‘queen bee’ theory (Whittock, 2002). Women who choose construction or engineering from a young

age have worked hard to prove themselves during their studies (Gurjao, 2011) leading one to believe that their self-perception would be higher than their male counterparts of the same age group.

C**areer paths**

The current structure of work is based on the traditional, linear career paths of men and fails to validate the path of many women who often benefit from non-traditional working relationships. The idea that flexible working is only sought by women who want to have families is not only incorrect but undermines the promotion and development of all women regardless of their personal circumstances. Furthermore, this notion acts to invalidate the desires of many men who wish to take a more active role in child-rearing. Powell *et al*. 's (2004) research on a large sample of female engineering students concluded that the 'one size fits all' approach for recruitment does not work as women have different needs and expectations from men. In a similar study by the Lloyds Banking Group, it was acknowledged that the path women take in their careers is varied as they are more likely to take time off work for children, resulting in a career that follows a 'zig-zag approach' (Cannon, 2014).

The majority of previous policies and initiatives failed to fully account for the gender differences because they focus largely on school-leavers and junior females. This failing was hypothesised more than 20 years ago by researchers who concluded that, 'the overall progression of women's careers has received little attention resulting in a lack of information on vertical segregation within the industry and individual organisations' (Sommerville *et al.* 1993). Lu and Sexton (2010) speculate further that the initiatives aimed at increasing the number of women in construction do not bring about sustained growth because they fail to acknowledge that the career path of women is typically more varied, with decision making being a 'product of

serendipitous circumstances and choices'. By developing a career model for senior female managers in small construction firms, interviews carried out by Lu and Sexton (2010) confirmed that career paths contained many turning points and did not follow a linear path. O'Neil and Bilimoria (2005) discuss how women's careers develop over time, particularly with regard to the impact of career contexts (societal, organisational and relational) and women's own changing images of their careers and career success. They proposed a three-phase age-linked model for women's career development, these are: the idealistic achievement phase (phase 1), the pragmatic endurance phase (phase 2) and the re-inventive contribution phase (phase 3).

The traditional concept of upward, linear progression is based on the working lives of men and leads to marginalisation and a sense of failure for women who do not follow this structure (Caven, 2006). Non-traditional working arrangements by women, for example part-time or temporary work, is seen by others as a way to work around family commitments. However, Allen and Truman (1993) highlighted that often women see their varied commitments as integrated and work or family is not necessarily more important than the other. By assuming that women want alternative working solely as a response to family commitments not only fails to recognise the non-linear career path that many women take, but it acts 'to devalue women's contributions to work in a way that does not exist for men, acting as a constraint on their careers' (Caven, 2006; Lu and Sexton, 2010). Craven (2006) further concluded that non-traditional working patterns could actually enhance a women's career development as women are able to form a career on their own terms.

Caven's research aligns with *Cracking the Code*, a study of companies that employ 680,000 employees conducted by KPMG and KPMG on behalf of the 30% Club, a group whose goal was to have women represent 30 percent of FTSE-100 boards by 2018.

Predictably, *Cracking the Code* reported that men are promoted more than women and are 4.5 times more likely to make it to executive level regardless of skill (Young Samuel Chambers (YSC) and Keith Peat Marwick Goerdeler (KPMG), 2014). Surprisingly, this held true for all women, even ones without children, concluding that the often-cited excuse of child-rearing cannot be blamed for women's lack of progression. Rachel Short of YSC revealed the opposing gender paradigms as a result of parenthood, 'the stereotypical reaction is that men are seen as becoming the breadwinner when they become a parent, whereas women are seen as becoming care-givers'. In a similarly vein, Urwin, (2014) found that men want to be more involved with child-rearing (and would benefit from more flexible working arrangements) and women wanted to take a more active role in their careers which are two powerful messages that all industries must embrace to ensure a sustainable, productive workforce .

In addition to the advances in career theories and research reviewed above, some scholars argue that the individual perspective of career emphasises the responsibility of the individual to plan and manage career throughout life. Therefore, one stream of studies has shifted the attention toward different ways in which individuals can manage their career (King 2001). However, environmental and organisational changes have impacted the need to develop a much broader concept of career. Contemporary literature adopts the view that career is "an individual's work-related and other relevant experiences, both inside and outside organization, that form a unique pattern over individual's life span" (Sullivan and Baruch, 2009). Hence, this definition embraces both individual and organisational perspectives.

Gender perception and self-perception

Analysis of self-perception of both men and women across different age groups and experience would help to elucidate whether both genders are affected in the same

way. The fact that men and women are not identical but offer different abilities that need to be equally embraced is a key message that does not seem to be taken on board when initiatives aimed at gender equality are being considered and formatted. French and Strachan (2015) confirmed that the impact of the equality initiatives on the representation of women in non-traditional work areas and in management is limited.

Agapiou (2002) asserted that the workforce in the construction industry is a result of traditional recruitment perpetuated by management and questioned 'why they continually re-create an all-male workforce and whether they can make any attempts to do otherwise'. After a series of interviews that were carried out in Scotland aimed at exploring if the existing attitudes of the workforce are acting as a barrier to management of change, it was found that overall, the male interviewees acknowledged that there is a place for women in the industry and that their skills are useful to the trades. Whilst few men were 'openly hostile' to the idea of women in the trades, they often cited other reasons why women should not work in trades like issues of strength and ability or lack of innate ability to use tools and they did not feel they were being prejudiced to hold these views. On the other hand, women stated that concessions should not be made to women and that they did not agree with 'the over-feminist type' that 'whine' or 'complain'. However, this is somewhat contradictory when they also cite having to be able to 'take a joke' to fit in, and having to be better at their job than the men to prove themselves. Agapiou (2002) concluded that the culture of the industry is changing and 'equal opportunities should be understood not as men and women being identical, but being equally important to the workforce because of the different capabilities and perspectives', a notion that is in fitting with this research report.

Not only is the perception of the workforce important to determine how or if

gender diversity is a possibility in construction, it is also necessary to realise the changing nature of the workforce. Traditional working arrangements are no longer the norm, with evidence suggesting that the younger generations do not hold the same values as their parent, that is, a secure job for life, and are putting greater importance into working arrangements that offer a better work-life balance (Lingard and Francis, 2005 and Worrall *et al*. 2010). Arguably, more men than women want policies aimed at childcare support, suggesting that this paradigm shift is true for men and women alike. Rumens (2013) suggests that more needs to be done to determine how men acknowledge their own gender in an attempt to better understand how particular masculinities harmfully impact both sexes in the construction industry. According to Oliver (2013), men still need to be part of the decision making process but nevertheless, understanding the perceptions of these decision makers is central to achieving a more gender diverse workforce.

Finally, the notion of meritocracy compounds the issues surrounding gender diversity as companies seek to 'play fair' in a historically unfair playing field. The issue of merit is debatable. In the USA, Castilla and Benard (2010) found that even though the intention of merit-based policies and initiatives is to motivate staff and ensure rewards based on merit, they can increase bias and reduce equality if there is limited accountability and transparency. The use of performance appraisal systems has also been cited in the UK construction industry as a barrier for women's progression as male managers are more likely to reward behaviour which matches their own, giving women lower appraisal scores and allocating less training (Dainty *et al*. 2000).

Research methodology

Before discussing the methodology in detail, it is helpful to address psychology as this research involves 'self-assessment' and 'self-reporting' of an 'individual's role'. Baron and Byrne (2000) argue, "self is a cognitive framework that determines how we process information about ourselves, including our physical attributes, personality traits, roles, motives, emotional states, self-evaluations and abilities". Similar to Chandra and Loosemore's (2004) study (who compared women in the construction industry with women in other male-dominated (legal) and female-dominated (nursing) industry), this research used self-report methods of data collection which relies on respondents answering questions about their own belief and behaviour. In self-report methods, the respondent becomes both the subject and object of study, which contrasts to inferential techniques, which rely on others' reports or observations about behaviour.

According to Brinthaupt and Erwin (1992), there are two types of research methods for self-reporting: (1) *spontaneous self* and (2) *reactive, evaluative self*. In a spontaneous self method, the respondent is usually asked to respond to open-ended questions relating to self-descriptions. In the reactive, evaluative self approach, the respondent is asked to make judgments about their competence or adequacy across a variety of content areas. This research adopted the latter approach because it enabled more definitive comparisons to be drawn between different respondent groups, which was one of this research aims. In adopting the reactive, evaluative self approach, data was collected via questionnaires because of the need to collect a large geographically dispersed sample. Furthermore, with effective design, anonymity was more easily assured and honest responses more likely.

The questionnaire adopted in this study consisted of three parts: Part (i) was related to general information; Part (ii) was related to self-perception and Part (iii) was related to diversity-specific initiatives. The questionnaire was designed with an assortment of Likert-scale questions (See Naoum 2019, p95). The following provides further details of the questionnaire.

Part (i) – general information

The general information section served a dual purpose in the research process. In the first instance, this section was used to gather baseline information about the respondents. Secondly, the questions were intended to ease the respondent into the survey and get them thinking about themselves and their background. In doing so, it was felt that they would be more comfortable and prepared to answer the questions with greater honesty. The general information section questions pertained to: gender age; relationship status; highest level of education; educational background in construction/engineering; area of the business currently employed; occupational grade; years spent in current role; years of experience in the construction industry; professional membership.

Part (ii) – self-perception survey

The second part of the questionnaire was aimed at ascertaining the self-perception of the respondents to distinguish if there are differences between how men and women perceive themselves, in general and throughout their careers. The survey instrument used was the 'updated' Messer and Harter's (2012) Self-Perception Profile questionnaire (SPP). As far as is known, the SPP represents the only self-concept measurement instrument that is specifically designed for full-time working adults. It comprises 50 Likert-scaled questions and asked people to rank the relative importance of 12 self-concept domains as described in Table 1.

Part (iii) – Gender Perception on diversity initiatives.

The last section of the questionnaire was designed to gain an insight into the perception of gender diversity in the industry as well as exploring the respondents' thoughts on initiatives aimed at increasing it. The literature review derived 14 initiatives and the respondents were invited to rate their perception by ticking 'strongly agree', 'neither agree nor disagree' 'strongly disagree' to each initiative. The questions in this section were related to a) the industry in general; b) women's personal situations; c) the organization itself (see details of the questions in Table 4 and method of analysis below).

The research sample

In order to obtain a set of gender data that can be statistically tested of men and women across all occupational grades and ages, the survey questionnaire was compiled in Survey Monkey (an on-line survey website). The questionnaire was distributed to 136 men and 103 women working in construction consultancy companies. Names of the companies were obtained from a population of top consultants operating in the UK published by the Building Magazine www.building.co.uk/data/top-150-consultants. These selected companies were homogeneous in their characteristics in that they are all multinational, offer similar services with a large turnover and have a large number of employees. The respondents were stratified in terms of age, occupation, marital status, academic degree and experience. The usable response rate was 48.9 % which provided a sample of 117 questionnaires, 60 in the men category, 57 in the women category. The composition of the research sample is shown in Table 2.

Method of analysis

As mentioned above, this study adopted the same methodology by Messer and Harter's (2012) on self-perception profile for adults. The 'updated' questionnaire was

554 used in this survey that comprised 50 Likert-scales questions. Some questions were
555 reworded to fit construction consultants. Responses were asked to rate the relative
556 importance of 12 self concept domains (described in Table 1). The rating of the
557 domains was assigned scores as strongly agree = 4 points, agree = 3, disagree = 2 and
558 strongly disagree 1. Similar to Messer and Harter's (2012) research, no middle or
559 neutral scale was included in the Likert-scales in order to provide a sharp and clear-
560 cut self-perception. A number of inferential statistical tests were considered to
561 determine the significant variance between the two samples. The *t*-test was selected as
562 it is a robust test with respect to the variances in the mean scores of the two groups
563 being compared (Naoum 2019, p 128). The data was first tested for skewness to
564 ensure that the sample did not violate the normality assumption. The authors tested for
565 equality variances when running the *t*-test procedure (this produced a significance *p*
566 value which if more than 0.05 indicates unequal variances and the null hypothesis was
567 accepted of no difference and if less than 0.05 indicates equal variance and the null
568 hypothesis was rejected).

569 The mean scores of Part (iii) of the questionnaire that aimed to compare
570 gender perception on diversity initiatives was calculated and ranked to measure the
571 amount and significance of a correlation between the ranking of the two samples on
572 14 initiatives (see Table 4). Here, the 'Spearman rho" ranking correlation was applied
573 to test for significance.

574

575 **Discussion of results**

576 *Self-perception of men versus women*

577 The *t*-test result did not show a significant difference in the mean scoring
578 between the two genders in their perceptions to sociability; job competence;

nurturance; adequate provider; morality; household management; intimate relationships; intelligence; sense of humor. Nine out of twelve domains, which are core for the two respondent groups, were very similar in their scoring among women and men (See Table 2). This result indicates that, despite the considerable barriers of women to entry and progress in construction as a career, their self-perceptions do not seem to be different from men, except for i) athletic ability i.e. physical capacity (the difference is significant at ($P<0.001$); 2) physical appearance (at $0.01<P<0.001$) and 3) global self-worth (significant at $0.05<P<0.02$). Further analysis into self-perception of women across their careers revealed that the career path of women is non-traditional and follows a sharper 'zig-zag' pattern when compared with men. Although men seem to experience dips in self-perception, they tend to occur at different ages across all domains and do not appear to follow the same trajectory as women. The domains of Job competence, morality and sense of humour dip in men at an earlier age than women, particularly at the age of (25-34). The *t*-test was applied on the data and the difference was high significance at ($P < 0.001$). Therefore, it can be concluded that gender do differ in their career paths where they show a deep dip at different ages.

The Physical Capacity that is perceived significantly higher in men, may not be surprising due to the gender stereotype of men have been more involved in sport and other physical activities (Rumens, 2013). However, what is interesting is that men are significantly happier with their physical appearance than women within the same age group. This may be a consequence of men's greater confidence or their higher standing in the industry. Happiness in physical appearance could be a reflection of the global self-worth core where the difference for the two respondent groups was significantly different.

Global self-worth

Global self-worth was described as the "individual's global perception of worth, independent of any particular domain of competence or adequacy. It is tapped by items such as liking the way one is leading one's life, being pleased with oneself, and liking the kind of person one is" (Messer and Harter, 2012). This was examined across all age groups to find out if global self-worth differs at different ages among both samples. Analysis of result showed that this domain scored the highest for young men with a mean of 3.50 (standard deviation of 0.59) as well as young women reported the same mean score of 3.50 (standard deviation 0.41). This suggests that, at a young age there is no difference in global self-worth between genders and one can assume they start out their careers on equal footing. However, when comparing the mean scores across all age groups, there was a clear trend that women's perception of global self-worth decreases at older ages from a high of 3.50 at ages 18-24 to 3.00 at ages 45-54 (see Figure 1a). On the other hand, men did show a slight decrease in their self-perception of global self-worth from ages 18-24 (3.50) to ages 25-34 (3.42), before increasing with every age group thereafter (see Figure 1b). In fact, out of all the age groups surveyed, men ages 55-65+ scored the highest on global self-worth (3.52).

This finding corresponds very closely with the previous research by the earlier work of Ellison and Cowling (2006), Lu and Sexton (2010) and Powell *et al.* (2004). These previous research concluded that the majority of women tend to leave the industry by the age 40 years old. In light of this, effective strategic plan, (such as training and changing the working practice away from the traditional structure during the ages of 35-44) would have a considerable impact on retaining the representation of women in the construction industry.

The result of this research also aligns well with the 'leaky pipeline' theory by Gurjao (2011) and Jenson *et al*. (2005). As noted earlier, the 'leaky pipeline' concept attempts to explain why more women who chose to study built environment and engineering do not result in more women in the industry and in senior positions, concluding that women are choosing to drop out or leave the industry at different stages of their career. Therefore, it can be argued that the 'leaky career pipeline' is a multilayer problem that involves the individual, family, society, institutions and governments. Hence, the problem needs to be addressed on multiple fronts, from the grass-roots to policy levels. The role of good mentoring by compassionate people in enabling women to retain or excel in construction careers has been recommended in recent research such as Francis (2017). However, it can be argued that concentrating solely on mentoring, will not assist in their advancement per say but rather keep them from leaving the industry.

Comparing Self-perception of women with and without a background in construction

This issue was analysed by comparing the mean domain scores for job competence of women who testified to not having a background in construction or not studying construction or engineering from a young age versus women who did. Analysis of the results did not show conclusive trends across the two sample groups. When viewing the mean scores for women across their careers, Job Competence in women who did not have a background in construction or engineering *fluctuates* across their careers. These women seem to hit low scoring from ages 35-44 (2.46) whereas women who choose construction at a young age actually reported higher scoring during the same period (3.32). This suggests that women ages 35-44 who have a non-cognate background require a unique strategy to motivate them not to leave the industry during that age. Therefore, more research would be recommended to determine the

exact cause for this drop in job competence rating among women and the best way to support this demography to avoid more women leaving the industry. Dainty and Edwards (2003) as well as Lu and Sexton (2010) suggested training is the most effective solution to attract new talent through non-cognate professionals with transferable skills. On the subject of comparing the managerial competencies of project managers in the USA, a study by Arditi and Balci (2009) found that female project managers do not differ much from male project managers in terms of their managerial behaviours but performed better in "sensitivity," "costumer focus," and "authority and presence."

Perception of the gender split in the industry.

This section of the questionnaire was designed to find out if women and men perceive the gender split in construction differently. 70.9% of women felt that gender diversity is an issue that needed remedying compared to just 39.7% of men. This statistic is worrisome to individuals in the industry that are working hard to increase diversity as it would appear that the majority of men either 'do not agree' or are 'unsure' that diversity is an issue in construction. Furthermore, the results did not show significant difference in views among men across ages, occupational grade or years in the industry. This finding is concerning as it suggests that age, grade and experience do not have an influence in the way men perceive gender diversity. It is concerning because this would suggest that the recent gender diversity and equality initiatives at the professional level have done little to shift relative attitudes towards masculinity at professional level. This, in turn, indicates that current initiatives to address gender diversity may be misdirected or at the very least, need to be broadened to change perceptions of masculinity.

86.3% of women and 75.9% of men perceived that the percentage of women in the industry to remain within 10 % and most would hold administrative positions. This finding supports the earlier survey by Briscoe (2005) that showed 50 % of all women in construction work in administrative and secretarial occupations, whilst only 14 per cent are employed in professional and associate occupations. 13 per cent are employed as managers and, of these, a small number are self-employed and managing micro enterprises. Less than 5 per cent of all women are employed in skilled construction and related trades, and this proportion is mirrored by the relatively small number of women trainees in the manual trades.

Perception on the use of quotas and merits to improve gender diversity.

Unsurprisingly, there was an overall agreement among women with the use of quotas and merits to promote females in construction. On the other hand, only a few men supported this notion with a majority of 81% were against it. When the data was statistically tested, the result was found to be significant at ($P< 0.5$) leading to conclude that there is a difference in views among women and men in relation to quotas and merits to promote women in construction professions. The debate about setting targets and quotas to increase women in leadership positions is compounded by the notion that promotion should be based on merit. The prevalence of the word 'merit', or words of similar meaning like 'best fit for the job' were frequently cited within the comments section of this survey. This is in support of previous research by Dainty *et al.* (2000), Castilla (2008), Castilla and Berard (2010) in that, inherit bias in performance appraisals and evaluations prohibit equal reward for equal performance which is a particular problem in the construction industry.

Comparison of Gender Perception on diversity initiatives.

The last section of the research questionnaire proposed 14 initiatives derived from the literature review and asked the respondents to express their perceptions on whether these initiatives would improve the retention of women by answering ‘strongly agree’, ‘neither agree nor disagree’ ‘strongly disagree’ (see the 14 initiatives and the calculation of *Rho* correlation in Table 3). In general, the initiatives proposed were equally supported by both male and female except for ‘Bring your child to work day’ that was ranked the lowest by both samples. Both men and women regarded ‘improved flexible working arrangements’, ‘transparent promotion criteria’, ‘return to work training’, ‘outreach programmes to schools’ as the most crucial initiatives to retain women in construction consultancies. When the data was statistically tested to find out if men and women differ in their ranking using the spearman *rho* correlation, the results did not show a significant difference and therefore it can be concluded that both genders gave similar weightings to the 14 initiatives (*Rho* = 0.9). However, it is worth highlighting here that there was a small difference in ranking of three initiatives across the genders. Women gave higher ranking than men to ‘transparent promotion criteria and feedback’, ‘improved mentoring/sponsorship’ and ‘better maternity / paternity benefits’. These three initiatives are related to the 'organization' which leads to suggest that women seem to be more focused on ‘fix the organization first’ than 'fix the industry' or 'fix the women's personal situation' (see Table 4 for details). This finding corresponds closely with the recent findings of Quelhas *et al.* (2019) who concluded that, it is extremely important to understand organizational behaviour in the face of many challenges, such as diversity of the workforce (for example, in gender, age, and ethnicity). Organizational behaviour provides a complex system to help explain, anticipate, and control its culture by comprising the whole system of variables such as organization’s structure, set of practices, policies and procedures.

Conclusion

This paper has reviewed and reported previous research on gender in the construction industry and revealed the finding of a survey into the self-perceptions of women in construction consultancies and compared them to men's self-perceptions in the same discipline and age groups. The paper also explored genders' perceptions on different diversity initiatives to improve retention of women in the construction industry. Analysis of the results revealed that both men and women perceived the percentage of women in the industry to remain within 10 %. In addition, 70.9% of women felt that gender diversity is still a serious issue that needed remedying compared to just 39.7% of men.

The result also showed that there were overall similarities between the self-perception profiles of men and women with regards to 9 out of 12 domains considered. The most significant factor in this research was found in the global self worth of women. At a young age there seems to be no difference in global self-worth between genders and one can assume they start out their careers on equal footing. However, when comparing the mean scores across all age groups, there was a clear trend that women tend to follow a 'zig-zag' career development path and that the 'global self-worth' of women over the age of 40 is the lowest among all ages. The general career path of women also found to follow a pattern of dip and rise in self-perception across all ages. This suggests that the career path of women is non-traditional and follows a 'zig-zag' pattern when compared to a relatively steady path for men. This leads to confirm previous research in that a 'one size fits all' approach does not address the problem to retain women in the construction industry as they do not consider the non-traditional 'zig-zag' career path of many women. For example, the fact that women's global self-worth decreases with age and self-

perception largely follows the same ‘zig-zag’ path as career development are strong indications that more must be changed to support women through the dips in their career development which usually happens after child-bearing years (ages 35-44). One such change is in the structure of the organization and the operation of corporate policies and procedures.

Both men and women regarded ‘improved flexible working arrangements’, ‘transparent promotion criteria’, ‘return to work training’, as the most crucial initiatives to retain women in construction consultancies. Among other important initiatives highlighted by the female sample are ‘transparent promotion criteria and feedback’, ‘improved mentoring/sponsorship’ and ‘better maturity / paternity benefits’.

A high proportion of both men and women have also added ‘merit’ or words of similar meaning in the further comment section of the questionnaire. They emphasised that merit is a crucial criterion that the organization should use for recruitment and promotion. This highlights that men and women alike believe that we live and operate in a meritocracy. Tackling the societal myth of meritocracy could lead to more progressive views on how to address gender diversity. The fact that women ranked ‘transparent promotion criteria and feedback’ the highest of the initiatives aimed at gender diversity, confirms that women would greatly benefit from a system based on merit.

In light of this research outcome, it can be concluded that the issue of gender in construction falls under three main categories, namely, a) the industry in general; b) women’s personal situations; c) the organization itself. Critical appraisal of the literature review and the general observation that came up from this research tend to lean more towards 'fix the organization first'. Therefore, it would seem logical for organizations within the construction industry to introduce an innovative "Strategic Human Resource Management System" (SHRMS) to effectively implement the business plan concerning

778 the management of personnel, bearing in mind the criteria of gender equality as an
779 integral element. The suggested concept of SHRMS will support the overall
780 organizational strategy and the development of changing culture. The system will in turn
781 incorporate important areas that deserve serious attention such as the gender issue in
782 construction. That involves proper strategic planning to modify and modernize current
783 practices, workplace procedures, training and mentoring, more flexible organizational
784 structures to account for the 'zig-zag' career paths of women who aren't interested in a
785 linear path for whatever reason, staff appraisal and criteria for promotion to ensure
786 equality and fairness of women in the organization.

787 **Date availability statement**

788 All data, models, and code generated or used during the study appear in the submitted
789 article.

790

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