

# Barriers Contributing to the Underrepresentation of Women in the Construction Industry

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**Abstract:** In recent years, the representation of women in the working population has improved. However, despite significant efforts in both academia and industry, the construction sector is still a male-dominated industry both numerically and hierarchically. This is a global issue, and the UK is not an exception. The gender imbalance in the UK construction industry starts with construction education and worsens as women progress in their careers. That is why the concept of the “leaky pipeline” is used in the literature to describe the problem of recruitment and retention of women in the industry. To investigate the barriers contributing to the underrepresentation of women in the UK construction industry, this research systematically reviews the literature from four databases from 1993 to 2023. Industry perception, motivation, environment, skill gap, role models, well-being, organisational support, satisfaction, career development, family responsibilities, and institutionalised inequality were identified as the main barriers for women in joining and progressing in the construction sector. This paper draws upon social cognitive career theory to discuss these barriers, the identified barriers were categorised into four dimensions: contextual influence, self-efficacy, outcome expectations, and goal orientation. In addition, the Super’s career development model was used to map these barriers to the leaky pipeline of women in the construction industry in four stages: exploring (pre-career), establishing (early career), mid-career, and late career. The research finds that industry perception and environment were barriers that prevented women from progressing in pre-career and early career, while family responsibilities were barriers that prevented women from progressing in mid-career and late career. The research provides an overview of the existing studies on barriers contributing to the underrepresentation of women in the construction industry. Also, this study shows that women face different barriers in their career development in the UK construction industry. This suggests that a combination of solutions should be considered to tackle the problem.

**Keywords:** Barriers, Construction Industry, UK, Women, Social Cognitive Career Theory

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## 1. Introduction

Despite years of continual efforts to promote women in the workplace, underrepresentation of women in different sectors has remained a cause for attention both in academia and industry. The global labour force participation rate for women is just over 50% compared to 80% for men (World Bank, 2022). The construction industry as a key to the success of national economies provides 7% of the world's total employment (International Labour Organization, 2024). According to the Transition Pathway for Construction of the European Commission, Women only make up around 10% of the construction workers in Europe. This figure consists mainly of women in administrative and technical positions, while those actively working on construction sites are a smaller group (EBC, 2024).

Many countries have implemented policies to promote women's entry into the construction industry. For example, the ‘Women Can Build’ course in Germany raises the professional awareness of women about the construction industry and broadens their skills and potential career paths (Vaccaro et al., 2024). Spain and Belgium have carried out ‘Women Can Build’ projects (Liang and Vansteenkiste, 2022) The French Government, in cooperation with construction associations, has carried out promotional activities targeting women's entry into the construction industry through the media, schools and vocational training institutes (Norberg and Johansson, 2020). Gender quota regulation in Norway requires that at least 40% of a company's board of directors be women (Ciappei et al., 2023). In a similar policy, countries such as Finland and Israel have mandated that enterprises have at least one women director (Liang and Vansteenkiste, 2022).

The UK construction industry has traditionally been seen as a male-dominated sector, and women participation rates have long been low, particularly in senior and technical roles (Suresh et al., 2023). Compared to other developed countries, progress in women’s participation in construction has been relatively slow in the UK (Suresh et al., 2023). Despite measures such as the Equality Act 2010 and gender pay gap reporting, representation has not improved as expected (Naoum et al., 2020). Cast (2024) found that in the second quarter of 2024, there were approximately 2.04 million people employed in the sector in the UK, of which, 340,000 are women. Newsdesk (2024) also found that 81% of women in the construction industry are in administrative and design jobs, while 6% of women are senior managers. To show this gradual decline in the number of women

entering to the sector to reaching their highest position, the concept of 'Leaky pipeline' is used as an analogy in the literature (Yan et al., 2024).

The existing literature explores the barriers for women in the construction industry, but few studies explore how the barriers change at different career or life stages. This research conducts systematic literature review, using the Super career development model to differentiate various stages of a person's career development and using Social Cognitive Career Theory (SCCT) as a guide to categorise the barriers identified in the systematic literature review. This will lead to a more nuanced appreciation of the barriers for women practitioners' entrance and progression in the UK construction industry over time.

## 2. Literature Review

The latest statistics from the ONS (Office for National Statistics) (2024) show that the construction sector employs 2.93 million people in the UK. Associated employment has increased by 3.3% compared to 2022 and accounts for 10% of the national workforce. Despite its significant contribution to the country's Gross Domestic Product (GDP), the sector faces a prevalent and persistent gender imbalance, with 84.1% of male workers in the construction industry compared to 14% of women workers, and a significant underrepresentation of women in technical and leadership roles (CIOB, 2023). In 1997, when ONS began to provide data for the construction industry, the number of women employees was 242,000, or 14.6% of the total workforce (Martin and Barnard, 2013). In 2023, women made up 14% of the UK construction workforce (ONS, 2024). The gender imbalance begins as early as construction-related educational programmes and becomes more significant as women progress through their careers. 'Leaky Pipeline' is a metaphor to describe the journey of women in the UK construction industry from early education through to their careers (Savickas et al., 2018). According to national statistical offices in Germany, Spain, Italy, Belgium, and Portugal, the leaky pipeline exists in Europe, with women make up 9% of the construction industry's workforce. The proportion of women in senior positions is 27% and in primary positions 38% (Auriol et al., 2022). Although there is some difference between countries, these figures show that women have higher loss rates than men at different stages of their careers (Lundberg and Stearns, 2019).

Initially, women show a considerable interest and talent in STEM subjects (Bigelow et al., 2017). In 2023, 78.4% of women students achieved A\*-C grades in GCSE STEM subjects, compared to 75.6% of male students (Buckley et al., 2023). However, only 30% of women continue to study STEM subjects at A-Level (UCAS, 2024). The second phase of the leaky pipeline in the UK construction industry begins as women move from education to career choices (Savickas and Porfeli, 2012). The number of women graduates in construction-related degrees, such as building surveying, civil engineering, construction project management, quantity surveying and property management in the UK in 2022 account for 33% of the total number of graduates from these programmes. However, 22% of the newly registered workforce in the industry in the UK are women (IfM Engage, 2024).

The early career stage represents another key stage in the leaky pipeline, where women leave the construction industry too early in their careers. Furthermore, for those women who persist, career paths in the industry are full of barriers that limit their progression into senior, technical and leadership roles (Mainiero and Sullivan, 2006). The gradual decrease in the number of women in UK construction sector suggests that despite initiatives and policies, women face extra barriers in this sector in comparison with their male counterparts. Therefore, it is important to understand the barriers faced by women who are already working in the industry and those seeking to enter the industry (English and Le Jeune, 2012).

## 3. Research Method

To clearly identify barriers for women in the construction industry, this research used a systematic literature review. The use of this method helps to reduce bias and produce clear findings with reliability. The findings were then analysed through social cognitive theory as a guide for categorising the barriers and finally using Super's career development model to map the barriers against various stages of individual's career development.

To ensure comprehensive coverage of high-quality research, searches were conducted using the Scopus, Web of Science, ProQuest and ERIC databases. Scopus and Web of Science are invaluable for tracking the development of research topics over time (Birkle et al., 2020). ProQuest was selected for its diversity of papers and conference proceedings (DEI, 2024). As the leaky pipeline starts with construction-related degree programmes in the universities, it was decided to include the ERIC database to ensure that the academic papers concerned with gender imbalance within these programmes are included in the literature review.

The keywords chosen for this research relate to “UK”, “construction”, “women”, “underrepresentation”, and “barriers”. Figure 1 shows the combination of keywords. The following two exclusion criteria were established: (1) studies of women academics working in construction-related schools, considering the research focus was the construction industry and women practitioners in the industry and not women educators in construction degree programmes; (2) literature written in languages other than English was excluded due to inaccessibility for the researcher. In pursuit of data integrity, searches are not time limited. According to the search results, the earliest study appeared in 1993. The broad initial search generated 1,413 papers, including peer-reviewed scholarly, and conference papers. Each paper was systematically recorded in Microsoft Excel, and following the PRISMA guidelines, the initial collection went through a rigorous screening process. As a result, 80 papers were selected for in-depth analysis and then organised in reference management software to facilitate efficient management and retrieval of sources. Figure 2 shows the flow chart for the paper selection decision.

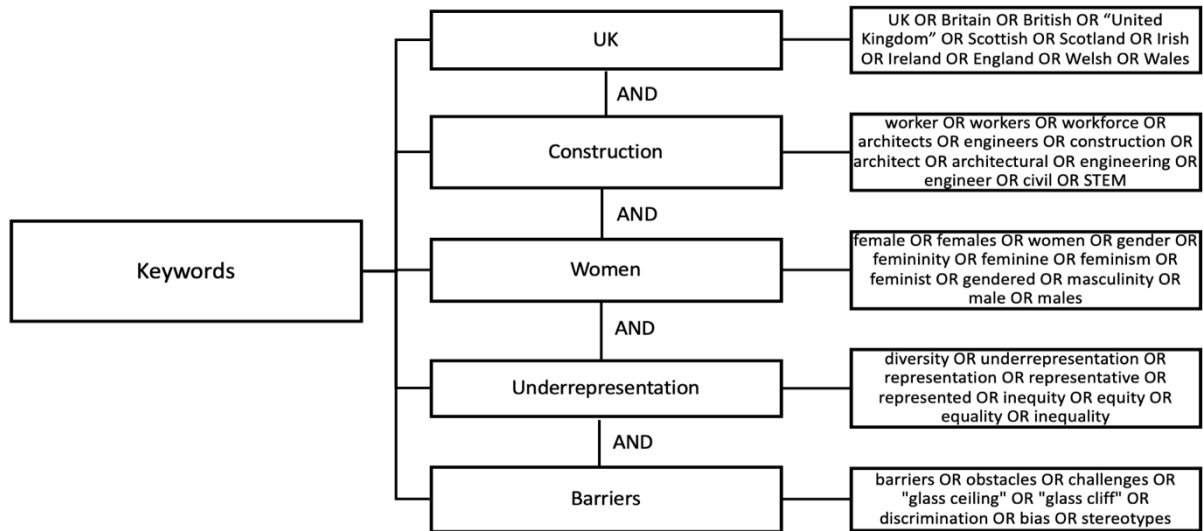


Figure 1: The final combination of keywords

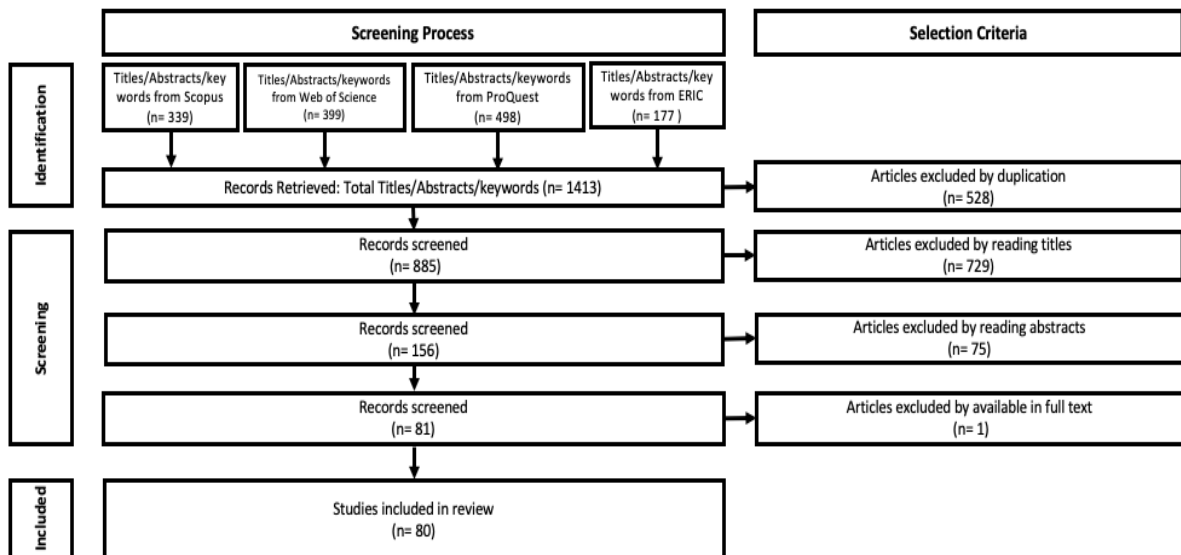


Figure 2: Flow chart for paper selection decision

#### 4. Result and Discussion

After the systematic literature review, this research classified the barriers for underrepresentation of women in the construction industry into industry perception, motivation, environment, skill gap, role models, well-being, organisational support, satisfaction, career development, family responsibilities, and institutionalised inequality.

The results show that industry perception, environment and skill gap were the top three barriers appeared in the papers.

## 4.1 Results

### 4.1.1 Industry Perception

Industry perceptions are deeply influential in shaping women careers, with the most influential factors being gender stereotypes and industry image. Stereotypes create a bleak self-image, a lack of confidence in one's ability to compete, and a belief that one is unable to pursue prestigious positions in more male-expressive careers despite having the skills to succeed (Gerdeman, 2019). Also, industry image persists discrimination across career stages, leading to the continued underrepresentation of women in professional roles (García-Jiménez and Herrero, 2022).

### 4.1.2 Motivation

Motivation is the key to influencing whether women choose to enter the construction industry and can be categorised as lack of awareness, interest, and aspiration. Kiernan et al. (2023) show that lack of awareness originates early in the career due to a shortage of information, inaccessibility or inaccuracy that causes women to feel unwelcome in the construction industry. When women lack interest in the construction industry, they are more likely to choose other industries (Padwick et al., 2023). The results emphasise the importance of developing career awareness at university, with access to more information about careers and an easier transfer of interest to research and career aspirations (Ahuja and Weatherall, 2023).

### 4.1.3 Environment

The male cultural environment in the construction industry often makes women feel less valued due to their gender identity (Navarro-Astor et al., 2017). Dainty et al. (2000) state that many women are faced with choosing between career and family at an early stage in their careers. The results show the importance of culture and a flexible work environment in achieving a positive work environment (Suresh et al., 2023).

### 4.1.4 Skill Gap

Skills are a key factor in women career development, and these skills include specific job abilities acquired through education, training, or practical experience (Blake et al., 2023). Lack of skills and subject knowledge not only substantially limit women's career progression in the construction industry, but also prevents them from progressing through the career exploration period by weakening their self-efficacy (Chan and Murphy, 2006). It is suggested that higher education should take measures to provide equitable opportunities to enhance student employability and support the talent pipeline (Chance et al., 2023).

### 4.1.5 Role Models

Bryce et al. (2019) indicate that many of the role models mentioned by practitioners were always male, such as fathers or uncles. The presence of women role models not only attracts more girls and women into the construction industry, but also inspires women engineers to rethink the value and change that women leaders can bring to the workplace (Chan and Murphy, 2006). It is suggested that role models are meaningful to students and that their achievements be emphasised as achievable, thus inspiring more women to participate and succeed (Henri et al., 2023).

### 4.1.6 Well-being

In early careers, women have to deal with a variety of challenges, including finding a balance between work and personal life (Kiernan et al., 2023). Hosseini and Sharifzad (2021) show that the lack of effective interpersonal support exacerbates this stress, leading to a feeling of isolation amongst women, which can in turn diminish their self-efficacy and self-confidence. In early careers, the industry should ensure that teams are diverse and that diversity and inclusion are valued in the work environment (Padwick et al., 2023).

#### 4.1.7 Organisational Support

The early career period is a time of professional growth for women, and effective support from organisations, such as the implementation of gender equality laws and guarantees of equality in company policies, can influence women's expectations of fairness and equality in the workplace (García-Jiménez and Herrero, 2022). For women, improving access to industry support services was the most common recommendation. Improvements related to training were emphasised, as well as the strengthening of equality among employees (Aboagye-Nimo et al., 2019).

#### 4.1.8 Satisfaction

Difficulties in achieving work-life balance have been recognised as a major challenge for women in the construction industry, negatively affecting their career progression and willingness to stay in the industry (Ghanbaripour et al., 2023). Improved work-life balance, a better working environment and competitive salaries are more likely to improve job satisfaction (Buckley et al., 2023).

#### 4.1.9 Career Development

Lu and Sexton (2010) show that external support from managers, mentors, and professional networks is one of the most important factors in facilitating women's career progression. However, Aboagye-Nimo et al. (2019) note male managers' difficulties in understanding and empathising with the unique challenges faced by women in a male-dominated industry.

#### 4.1.10 Family Responsibilities

In mid-career, women are usually at a key stage in their career development and need to balance their professional ambitions with family responsibilities. The additional stress during this period may lead to the adjustment or abandonment of career development goals (Aboagye-Nimo et al., 2019). Offering flexible work arrangements such as flexible hours, telecommuting, and job sharing can help women manage their work and family (Suresh et al., 2023).

#### 4.1.11 Institutionalised Inequality

As their careers progress, women may feel the profound impact of these long-standing systemic barriers on their development (Ahuja and Weatherall, 2023). These inequalities not only limit their career choices, but also have a profoundly negative impact on their goal orientation in the broader professional environment (Chance et al., 2023).

## 4.2 Discussion

Social Cognitive Career Theory (SCCT) proposed by Lent et al. (1994) is a well-referenced framework to understand factors that influence career development of individuals. SCCT emphasises the interconnections between cognitive processes and interpersonal factors, as well as the context in which an individual makes a career decision. SCCT recognises that an individual's career path is the result of the interaction of multiple career elements, including contextual influence, self-efficacy, outcome expectations and goal orientation (Lent et al., 2017).

Contextual variables influence individuals' career interests and choices by shaping learning experiences and act in career decision making. Contextual variables overlap with each other and have different effects on academic and career performance at different stages (Wang et al., 2022). Lent et al. (1994) proposed that career development is influenced by objective and perceived environmental factors. So that industry perception, motivation, and environment barriers identified in the systematic literature review are directly related to the contextual variables of the SCCT.

Self-efficacy is a belief in an individual's ability to achieve a goal (Bandura, 1997). Self-beliefs as dynamic and related to the task-related environment or the nature of the task itself (Lent and Brown, 2013). For women in the construction industry, strong role models and positive learning experiences can increase self-efficacy and encourage women to participate in the industry (Henri et al., 2023).

Outcome expectations are perceptions of the results, effects or consequences of certain behaviours (Lent et al., 1994). In the context of career development, positive outcome expectations may include receiving financial

rewards, achieving career progression (Shirley et al., 2016). Satisfaction and organisational support barriers identified in the systematic literature review interact with outcome expectations to enable women to pursue long-term career goals in the construction industry (Blaese et al., 2021).

Goal orientation shaped by self-efficacy and outcome expectations helps individuals to organise, direct and maintain career-related behaviours (Lent and Brown, 2013). Women with goal-orientation more likely to persist when faced with career challenges (Kiernan et al., 2023). However, institutional inequalities and family responsibilities limit women's ability to maintain a focus on career development, which hinders their persistence in the industry (Blake et al., 2023).

Super career development model proposed by Donald Super (1980, p. 282) defines a career as “the combination and sequence of roles played by a person during the course of a lifetime”. Super career model is based on the belief that self-concept changes over time and develops as a result of experience. Super (1980) extends the stages of life and career development to five stages: exploration (pre career), establishment (early career), midcareer, late career, and decline.

During the exploration stage, individuals try out various career options and gain the knowledge and skills needed to enter the industry. For women, factors such as industry perceptions, motivation, and role models are influential in this stage (Super, 1980). In early career, women are often unfamiliar with the construction industry due to a lack of information, inaccessibility or inaccurate information, which further hinders their career exploration (Kiernan et al., 2023). During the establishment phase, women face barriers in adapting to a male-dominated work culture, dealing with sexual harassment, and balancing work and life demands (Zhang et al., 2021). These situational variables affect career development in the early stages. In mid-career, mentoring and workplace flexibility promote career development. Research emphasises that mentor support can overcome barriers and sustain career motivation (Agyekum et al., 2024). Henri et al. (2023) suggests women's career goals are influenced by personal and professional factors and require a balance between work and family responsibilities for long-term career development.

Combining the SCCT with Super career development model, these barriers can be categorised into four key dimensions - contextual influence, self-efficacy, outcome expectations, and goal orientation - that are related to the four stages of career development: exploring, establishing, mid-career, and late career. The theoretical intersection provides the framework used to understand the complex dynamics affecting women's career development in the construction industry, as shown in Figure 3.

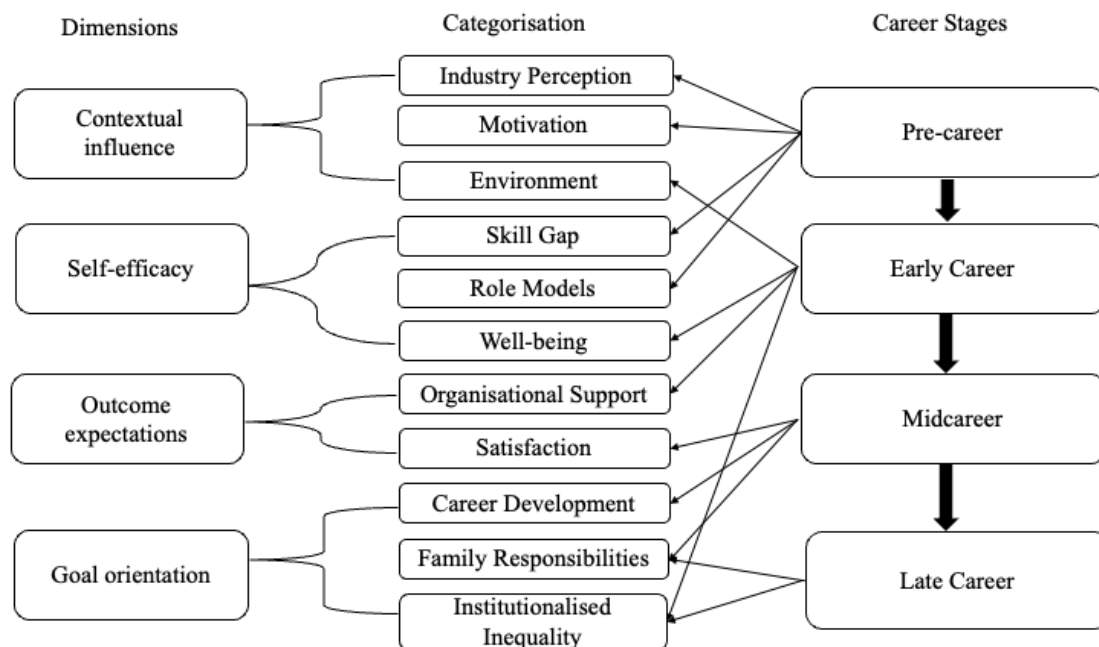


Figure 3: Application of SCCT through the lens of Donald Super's career development model

## 5. Conclusion

This research identifies 11 barriers that contribute to the underrepresentation of women in the UK construction industry through a systematic literature review analysing 80 articles from the last 30 years. Through social cognitive theory, the identified barriers were categorised into four dimensions: contextual influence, self-efficacy, outcome expectations, and goal orientation. In addition, Super's career development model was used to map these barriers to the leaky pipeline of women in the construction industry in four stages: exploring (pre-career), establishing (early career), mid-career, and late career. The research finds that industry perception and environment were barriers that prevented women from progressing in pre-career and early career, while family responsibilities were problematic at later stages.

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