**Sexism and Project Studies: The Case of Construction and Engineering Organizations**

**Abstract**

Sexism involves antipathy toward, and negative stereotypes about women. This phenomenon which has the effect of handicapping selected groups in terms of salary and access to jobs, promotions, and power, is particularly relevant to male-dominated professions such as construction and engineering. Despite the importance of this topic and the potential negative impact it can have, in a project context, project management literature vastly neglected the role of Sexism. For instance, project studies lack from an inclusive framework which defines the most common forms of Sexism in projects, their consequences at organization and individual levels and, hopefully, measure to deal with them. This research will focus particularly on engineering and construction sector, which are an exemplar sector for project studies and among the most male-dominated industries in every developed society. This paper intends to pave the way to the research of Sexism in project studies. To this end, the paper presents a systematic review on business management and engineering literature to examine the perception of Sexism and how other researchers have pointed out this phenomenon. Through a thematic analysis the paper shows that the literature on Sexism and gender bias within construction and engineering organizations is focused on four main areas 1) nature and source of Sexism, 2) current situation of the construction and engineering sector with regards to inequality and underrepresentation of women and barriers and challenges for women in these environments, 3) the consequences of Sexism and 4) strategies for dealing with and reducing Sexism in construction and engineering organizations. Considering the paucity of theories and frameworks to support gender equality in a project context, this research suggests that researchers in the field of project studies should adopt a broader view in identifying the existing challenges in order to include the overarching effects of Sexism on projects and their stakeholders.

**Keywords***: Construction and engineering organizations, Sexism, Gender bias, Systematic literature review*

1. **Introduction**

In most of the western world, explicit forms of sexism have decreased since the instatement of laws such as the Civil Rights Act of 1964, which banned practices which tend to discriminate against women (Dovidio and Gaertner, 1998). However, Sexism has not disappeared, but is muted in subtler form; examples of sexism still exist in many contexts and particularly in male-dominated professions. Research shows that women experience everyday Sexism and gender inequality in male dominated professions (Powell and Sang, 2015). Examples of male-dominated professions includes firefighters, construction, civil and mechanical engineering, truck driving etc. Clearly some of those professions belongs to project based industry, notably (but not only!) construction and engineering.

The underrepresentation of women in the construction and engineering sector, which are among the most male dominated sectors, has been discussed and documented by many researchers (Agapiou, 2002; Lu and Sexton, 2010 ; Powell and Sang, 2015; Pinto et al., 2017). This is in line with the shortage of skilled workers in the construction sector which includes women alongside minorities (Menches and Abraham, 2007). In UK alone, *"Less than 15% of [female] aged 16-35 would consider a role in construction, only 13% of the UK workforce are female, and one in five construction businesses in Britain have no women in senior roles"* (Varley, 2018). This matter is not only discussed by scholars but also mentioned frequently in practitioner publications as well. The Association of Project Management (APM) and Project Management Institute (PMI) are among institutions which address this issue within the project contexts (Atkins-Hansen, 2001; Griffiths, 2019).

Sexism involves antipathy toward, and negative stereotypes about, agentic women (Glick and Fliske, 1996). This phenomenon has the effect of handicapping selected groups (women) in terms of salary and access to jobs, promotions, and power (Clayton, 1992). This problem is particularly relevant to male-dominated professions such as construction and engineering (Powell and Sang, 2015). In this research we will focus on the construction industry which is one of the most male-dominated industries in every society (Loosemore and Lim, 2015). The experiences of other sectors show that improving opportunities for women leads to a workforce that is better informed, and to organizations which are more adaptable, closer to their customers and more responsive to market changes (Coussey and Jackson 1991).

Although there is scant scientific research on Sexism in engineering and construction sectors, there are more data and information in practitioners' literature which point to this problem. According to (RICS, 2018) nearly one-third of women in construction believe that fear of Sexism has held them back from pursuing senior roles. This phenomenon is present at all organisatioanal levels. 73% of female engineers have experienced sexual discrimination, harassment or victimization at work. More than half of the people working in the construction industry have witnessed or experienced Sexism (Construction Manager, 2017). Despite comprising over 50% of the population, women still make up only 11% of the construction workforce; this number drops to just 1% of operatives on-site even in the UK. Women in the construction industry experience different sorts of Sexism including lower salaries, delay in their career and sexual harassments (Building, 2018).

Although the concept of Sexism is generally discussed in male dominated professions, research focusing on Sexism and gender bias within projects and particularly in engineering and construction projects is extremely limited. A simple search in Scopus with the key words "Sexism" OR "Gender bias" AND "Project management" reveals only 2 articles which have been published in "project management journals". These include the work done by Pinto et al. (2017), Henderson et al. (2013).

Pinto et al. (2017) report on the results of a study that examines attitudes toward male versus female candidates applying for a project manager position. In this study, the authors sample project professionals in several organizations, using a scenario-based assessment, to determine their reactions to a male and female candidates applying for the same project manager position. The findings show that the only evidence of gender bias is in relation to perceived technical competence of the candidates. In situations where the technical competence of the job candidate was perceived as low, the female candidate was less likely to be hired over a male counterpart. On the other hand, as a candidate's perceived technical competence increased, the opinions were significantly in favor for the female job seeker, who was more likely to be hired over a male candidate.

Henderson et al. (2013) explore women project managers as a group in order to develope new understanding about the current project context within which women work and to promote new research-based ideas to enhance their potential in business organizations. Their study explores demographics and project characteristics, project challenges and issue selling moves, alongside women’s perspectives on the advantages and disadvantages which exists for them in this profession. The research results reveal clear associations among women project managers’ career, age, cost of their projects, and their professional certifications. In addition, the results show women’s perception of advantages and disadvantages in the project management profession; while women project managers continue to experience marginalization from gender bias, they are dealing with particular job challenges and issue selling circumstances to their advantage in moving through gender bias.

In summary these studies confirm that women are underrepresented in project management roles in traditional project-based industries such as construction and engineering alongside being underrepresented in upper management positions.

The main aim of this paper is to bring together the most relevant knowledge about Sexism to pave the way to research on this topic in project studies. In particular, the research underpinning this papers had three objective

1. Identify the key forms of Sexism and gender bias in construction and engineering organizations
2. Identify the impact of Sexism and gender bias on individuals and organizations
3. Identify measures to deal with and reduce Sexism and gender bias in organizations

The research method to achieve aim and objectives is a systematic literature review. In this systematic review, we develop a model that divides the literature on Sexism and gender bias in engineering and construction sector into five narrative themes that reflect their underlying contributions. We suggest that Sexism in projects and particularly construction and engineering organizations can be understood by following four areas: 1) nature and source of Sexism, 2) current situation of the construction and engineering sector with regards to inequality and underrepresentation of women and barriers and challenges for women in these environments, 3) the consequences of Sexism and 4) strategies for dealing with and reducing Sexism in construction and engineering organizations. As a result of scrutinizing these four areas, the contribution of this review is to promoting research of Sexism in project studies by increasing awareness on the benefits of gender equality for construction and engineering projects and suggest strategies for moving towards gender equality in these organizations.

This paper is structured as follows. We start with discussing the concepts and status quo of Sexism and gender bias in male dominated professions particularly construction and engineering. Next, we describe the methodology for the systematic literature review and provide a picture of how we tend to analyze the literature review results. We then present the results of the thematic analysis of the literature and discuss the emergent themes through examples of how they are reflected in the literature. The final section highlight key elements arising from our analysis and provide some suggestions for future research directions.

1. **Background**

Sexism is generally known as oppression of, or discrimination against, members of a group on the grounds of their sex. Although the definition of Sexism includes both genders, the common understanding and application of Sexism is in contexts where women and girls are the subject. Researchers and scholars have defined Sexism in different ways. According to Cudd (2005) Sexism refers to a historically and globally pervasive form of oppression against women. The European Institute for Gender Equality (EIGE) defined sexism as “Actions or attitudes that discriminate against people based solely on their gender” (EIGE, 2021). Another term used for unfair treatment of individuals based on their gender is gender bias. Gender bias is according to the EIGE is "Prejudiced actions or thoughts based on the gender-based perception that women are not equal to men in rights and dignity" (EIGE, 2021) This term is particularly applied in a workplace context. As it appears from the definitions “sexism” is a more overarching definition in comparison to “gender bias” which is more specific and particularly refers to gender-based perceptions on inequality of men and women. In our literature review, we take into account sources which refer to any of these terms, in order to cover a broader range of studies.

Gender bias, in workplace, can lead to different attitudes towards male vs. female co-workers, due to which one group might obtain advantages in career development and work engagement (Arroyo et al., 2018). McLoughlin (2005) identifies three types of biases towards women: 1) singling out women with the intention to harm (overt Sexism); 2) singling out women with neutral intentions (tacit Sexism); and 3) singling out women with the intention to help them. This categorization is in line with categorizing Sexism into two groups of hostile vs benevolent Sexism (Glick and Fliske, 1996; Becker and Swim, 2012; Jones *et al.*, 2014; Williams and Polman, 2015; Taylor et al., 2015).

Hostile Sexism fits with the classic definition of prejudice by Allport (1954) which entails antipathy towards women. While hostile Sexism is often aggressive, benevolent Sexism is "a subjectively favorable, chivalrous ideology that offers protection to women who embrace conventional roles" (Glick and Fiske, 2001, p.109). Benevolent Sexism can include sensitive, helpful and kind behavior, but it also includes behaviors such as the use of protective, overly intimate references such as "honey" or "sweetheart" and patronizing language that conveys beliefs about the weakness of women (Williams and Polman, 2015). Various studies confirm that workplaces are central sites for many women's experiences of Sexism. This includes both types of hostile and benevolent Sexism such as unpaid and unrecognized work, barriers to career growth and being exposed to physical, unwanted contact (Vachhani and Pullen, 2019).

These phenomena are particularly relevant in societies and environments where distribution of benefits and burdens is justified based on individuals' sex (Pepper, 2013). A clear example of such environment is the engineering and construction sector ( Henderson, Stackman and Koh, 2013; Powell and Sang, 2015 ; Pritchard and Miles, 2018; Bridges *et al.*, 2020 ; Scott-young *et al.*, 2020).

In light of the definitions above and the focus of our study, we have decided to include both categories of Sexism (e.g. hostile and benevolent) and within the industries which are "recognized" as male-dominated including construction, architecture and engineering. As mentioned earlier, the research on Sexism within the project context is scarce, therefore, in structuring the review of literature, we aim to include articles that consider the phenomena of Sexism and gender bias on three level:

Micro 🡪 individuals ; female employees

Meso 🡪 Single organizations which can be either permanent (e.g. a firm) or temporary (a project organization)

Macro 🡪 An industry or sector (e.g. the UK construction sector)

We consider women in construction, architecture and engineering industries, in all different job roles and levels and the impact of Sexism and gender bias in all abovementioned levels.

1. **Research method and overview**

**Data collection**

This paper adapts the approach illustrated by Maddaloni and Davis (2017) to conduct a systematic literature review in project studies. This study is based on a review of the content of the research papers on the topic of Sexism and gender bias in construction and engineering organizations, to extract the major research streams and to identify to what extent this phenomenon has been recognized by academics and researchers in this field.

The focus is on studying the research outcomes, concentrating on the recognition of Sexism and gender bias in construction and engineering organizations. The research goal is to summarize and integrate the findings, to derive the gap in knowledge and identify future research directions.

The Scopus database was selected as a data source for this study due to its comprehensiveness and coverage of publications from diverse areas (Mariam et al., 2020). The first step we took was to retrieve all articles with the specific keywords of "Sexism" OR "Gender bias" AND "Project". The search was limited to all articles within the subject areas "Engineering" and “Business, Management and Accounting”[[1]](#footnote-2), with no year limit. The online retrieval was conducted on the 5th December 2020 and 292 documents were obtained.

In the second step, we identified a list of keywords specific to our research objectives. Based on our background study and discussions among authors, the following key words were found relevant to the area of investigation and helped us extract the most relevant articles among the initial 292 articles found.

*Construction, Engineering, Women, Female, Employees, Career, Growth, Hostile, Benevolent*

A total of 42 articles were retrieved after the second selection stage. The coding was done using the qualitative variables of “research question”, “contributions” and “findings” of each article (Laplume et al., 2008). Having reading through the articles, it became apparent that some of the retrieved publications were less relevant as the keywords only appeared once in the paper, or they were not the main focus. Moreover, articles that investigated sectors such as filming and media, health, fashion, academia, financial services and the like., were excluded. The organization structure is presented in Figure 1.

**Data Analysis**

In order to analyze the literature, thematic analysis was used since it allows to emphasizes identifying, analyzing and interpreting patterns of meaning (or "themes") within qualitative data (Braun and Clarke, 2006).

Figure 1. Publication retrieval process (Adapted from Maddaloni and Davis , 2017)

Stage 1

Stage 2

Stage 3

Search string developed from initially identified keywords with the help of “AND” and “OR” and with no time span in Scopus

Identifying secondary list of key words specific to research objectives

Containing keywords in title or abstract

Relevant in content

8 words

292 articles

42 articles

1. **Findings – thematic analysis**

The thematic analysis enabled us to describe the state of the art of research on sexism and gender bias in construction and engineering organizations. In our research we systematically analyzed the articles’ research objectives, theoretical underpinnings, methodologies and contributions. In this way we can conclude the main features of the research carries out on this topic.

The analysis of the theories used by authors reveals that 60% of the papers clearly set their work within a particular theoretical context. The theories used are presented in figure below:

Figure 2. Theories used in articles

The proportion of articles with no theoretical foundations, reveals that this topic is highly perceived as a practice oriented. In addition, this topic has been scarcely studies from a project management perspective.

Another thematic dimension focuses on the methodologies applied by the authors. A range of different methods have been used by the authors including systematic literature review, action research, survey, interview, sessions with expert advisory groups, Delphi study and secondary data analysis (Figure 3). Interviews and surveys have been the most common methods applied in the article analyzed. Apart from 2 articles, the rest involved only women as the research participants. Although this is to be expected given the scope of these studies, there is a potential for further research to study this topic should include the perspective of male employees as well.

Figure 3. Methods applied in the articles

The third thematic dimension views the main focus of each article and the research problem considered. The 42 articles fall into one of the 4 categories presented in Table 1. Among the articles reviewed, only 4 articles focused on the education of female students and the reasons behind underrepresentation of women in technical fields in Universities (Chivers, 2007 ; Hossain and Kusakabe, 2011; Cross, 2015; Isaac, 2019). This is a remarkable result, particularly for construction companies / project based industry because it shows that not only there are few women in the sector, but there is also a scarce interest in understanding why it is so, and what it can be done about it.

*Table 1. Research categories*

|  |  |
| --- | --- |
| Category | Description |
| 1. Nature and source of Sexism
 | What is Sexism and gender bias and what are the reasons behind formation of these phenomena  |
| 1. Current situation and barriers and challenges
 | Analysis of the current inequality and underrepresentation of women in engineering and construction environments and the barriers and challenges women face in entering the construction and engineering organizations and their career growth |
| 1. Consequences
 | The consequences of sexisms and gender bias on female employees’ mental health and well-being and their career growth |
| 1. Improvement strategies
 | How to increase and improve the presence and growth perspectives for women in construction and engineering organizations |

The *nature and source of Sexism* is the one category which has been least paid attention to within the articles studies (Jones *et al.*, 2014; Powell and Sang, 2015). The reason might be that the scope of our literature search has been within the field of engineering and business. An important direction for future research is further investigation on the nature of Sexism and gender bias and the reasons behind the formation of these phenomena in general and in male dominated professions in particular.

*The current situation with regards to inequality and underrepresentation of women* in construction and engineering organizations has been discussed in 30% of the articles, such as Johnson et al. (2005), Dainty *et al.*, (2007); Caven (2015) and Choi *et al.* (2018). These articles reveal that women working in male dominated professions such as construction and engineering are earning less that their fellow male colleagues. The culture of masculinity is evident, present and most women perceive their workplaces competitive and conflictual where women are overtly and covertly discriminated by men. The construction industry in particular is lacking diversity due to adherence to traditional practices, old style apprenticeships, itinerant workforce and intestine deployment of labor (Clarke and Gribling, 2010). Nevertheless, although the majority of existing studies confirm that the current climate is not in favor of women, there is evidence that that men in the industry regarded as the gatekeepers are now finding new ways to respond to and make sense of the changing workplace, and due to the fact that that women are now actively encouraged to participate, legally protected against discrimination and more represented in non-traditional areas of the construction industry. Women, in different roles, are also findings approaches to position themselves within this new environment and to deal with issues of gender (Agapiou, 2002). According to George and Loosemore (2019), “the focus of attitudes towards masculinity in the construction industry seem to be shifting to reflect trends in the wider population and may be more inclusive and less hegemonic than has been previously argued.”

The category of *barriers and challenges* for female employees in construction and engineering organization has received the most attention among the reviewed articles. The main challenges and barriers mentioned in the articles include (Sang, et al., 2007; Menches and Abraham, 2007; Dainty *et al.*, 2010; Fielden *et al.*, 2010 ; Henderson et al. , 2013; Arroyo et al. , 2018 ; Pritchard and Miles, 2018 ; Vachhani and Pullen, 2019; Mariam et al., 2020; Bridges *et al.*, 2020) :

* Slow progression and poor promotion prospects
* Long working hours and work life imbalance
* Masculine culture: conflict and aggression
* Feeling invisible and isolated
* Pay gap and restriction to certain roles
* Issue selling problems

The consequences of gender bias and experience of every day Sexism by women working in construction and engineering organizations have been identified as mental health and well-being related impacts, lower performance and efficacy and high retention rates. Jones *et al.* (2014) argue that sexism and particularly benevolent sexism, negatively impacts targeted females’ cognitive performance. This particularly applies to cases where high powered men exhibit benevolent Sexism on low-powered women. The reason benevolent sexism is particularly harmful, might be that it directly targets individuals’ self-efficacy and also the ostensibly benign nature of benevolent sexism can make it considerably more difficult to detect and therefore manage, as opposed to its hostile counterpart. Gender, has been identified as an important factor contributing to stress in architecture. The women’s mainly subordinate positions in this profession seem to be one of the main reasons for them experiencing lower overall job satisfaction in comparison to men and thus turnover intensions (Johnson et al., 2005; Sang et al., 2007).

The literature composing our sample reveals several strategies for addressing Sexism in construction and engineering organizations providing relevant recommendations. The existing support include a range of initiatives comprising associations such as “National Association of Women in Construction NAWIC”, which is an international association whose primary purpose is to enhance the success of women in the construction industry through networking, education, and certification. Another support organization is “Tradeswomen Now and Tomorrow TNT", which is a coalition of labor unions, government agencies, and vocational institutions who are committed to achieving economic equity for tradeswomen by increasing the number of women in trade and technical fields, and by fostering equality in the workplace (Menches and Abraham, 2007). In addition, design of policies that may directly or indirectly impact on gender equality are in place in some organization (Galea *et al.*, 2015). There is a potential for further research on particular strategies and how they have worked in different organizations.

With regards to the recommendations, the following were mentioned:

* Construction educators and employers partner to get together to proactively affect culture change by addressing gender bias and consciously creating a female-friendly, inclusive culture through gender-appropriate support systems and resilience training for emerging construction professionals (Scott-young et al., 2020)
* Strengthening the National Childcare Strategy to implement ‘affordable, accessible and available childcare for all and implementation of gender pay audits in organizations (Perrons, 2009).
* Marketing the inclusion of women in the construction industry as a way to improve business through diversity rather than a requirement for social justice (Agapiou, 2002)
* Organizations creating their own organizational culture and practices, which could help to utilize women’s talent and improve their professional careers (Hossain and Kusakabe, 2011)
* The construction sector should critically evaluate how to create more balanced leadership positions (Styhre, 2011)
* Professional bodies should have Stronger approach to help improve the position of women. Examples are the creation of the Association for Project Management (APM) Women in Project Management Specific Interest Group (WiPM SIG) and its annual conference in UK, the Major Project Association’s Gender Balance Initiative, and WISE (Women in Science and Engineering), who have created a Ten Steps campaign to improve women’s retention and progression in the industry (Pritchard and Miles, 2018).
* Development of intervention strategies to deal with identified barriers to women’s and girls’ involvement with technology (Chivers, 2007)

The literature reports the different challenges and barriers women experience in male dominated professions and clearly indicates that there is a need for a better understanding of the problem and how these can be addressed at all levels (e.g micro, meso and macro level). Most of the articles we studied demonstrated to be effective at the individual (micro) and mainly the sector level (macro) but fail to indicate how sexism and gender bias affects project within male dominated professions. Thus the question arises as to how generalizable the challenges and barriers and also the recommendations and solutions are when it comes to project-based organizations and project employees.

1. **Discussions and conclusions**

Until few years ago most of the papers in project studies were focused on the so called “Iron triangle”, i.e. they were concerned about how a project can be delivered on time, budget and quality (or scope) (Atkinson, 1999). To this aim, the project literature proposed several papers about tools and techniques for the management of scope, risk, time etc. (Munns and Bjeirmi, 1996). With the exception of a few papers focused on leader and leadership (Muller and Turner, 2010), “People in projects” where seldom discussed and often only from an organizational perspective. In recent years there has been a much needed shift in project studies literature, with studies trying to move away from the iron triangle focusing more on people, often project stakeholders (Shamas-ur-Rehman and Ogunlana, 2010).

Only recently project literature really tried to embrace social sustainably or, more in general sustainability, distinguish on the “sustainability by the project” (i.e. a sustainable delivery during the project phase) and sustainability of the project (i.e. what has been delivered)( Huemann and Silvius, 2017; Sabini, et al., 2019). This paper intends to contribute to the stream of “sustainability by the project” focusing on the role of women in planning and delivering projects. In particular, it focuses on sexism and gender bias, two phenomena that, despite being incredibly common in project based industry, received extremely limited attention in project studies.

Gender equality is such an important elements of sustainability to represent one of 17 United Nation Sustainable development goal. Also, Sexism in workplace relates to the sustainable development goal 8 “decent work and economics growth”, which “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all” (United Nations, 2021).

This paper aims to bring together the most relevant knowledge about sexism to pave the way to research on this topic in project studies. Remarkably, if sexism and gender discrimination in the work place is mostly a disregarded topic in project studies, there is a consistent body of literature (outside project management journals). The key issue of this body of literature is that does not focus on the project business, but it is mostly concerned with sectors and women working in operation (Caven and Astor, 2013; Francis, 2017; Arroyo et al., 2018 ; Scott-young et al., 2020). On the one hand surely project studies and project based companies (e.g. construction) can learn from operation bases sectors (e.g. automotive). However, on the other hand, we must be cautious when we attempt to do this theory transfer because of the peculiarities of the project sector, such as temporalities. Let’s for instance consider automotive vs construction. In the automotive sector there is a “permanent factory” where the vehicles are built. Unless the factory closes, workers and managers can expect to go to work in the same place for an indefinite number of years, daily commuting from their houses. In the construction sector, a company (particularly a large one) might manage construction projects all across the country, the continent or the world. These construction projects have (usually) clear beginning and end, so workers and managers move to a site to the next, “coming home” only for a few days. This setting is clearly different, from the automotive, and so the impact on people (male and female), therefore issues and measures would be different limiting the “knowledge transfer” from automotive and construction.

As a bottom line we need specific research focused on Sexism in projects. Fortunately, this research journey can leverage a rich existing body of research, where the researcher can find definition, theoretical lens, epistemological and methodological approaches.

Despite the significance of this study, the data set used for the systematic literature review was limited to the Scopus database. Therefore, the study may be limited by the coverage of publications in Scopus. Also, only documents published in English were considered, excluding other possibly relevant documents published in other languages. Further studies can be conducted using a combination of databases and documents published in other languages.

**References**

Agapiou, A. (2002) ‘Perceptions of gender roles and attitudes toward work among male and female operatives in the Scottish construction industry’, *Construction Management and Economics*, 20(8), pp. 697–705. doi: 10.1080/0144619021000024989.

Allport, G. W. (1954) *The nature of prejudice*. Cambridge, MA: Perseus Books.

Arroyo, P., Christensen, R. and Alves, T. (2018) ‘Impact of Gender Bias on Career Development and Work Engagement in the OAEC Industry and Lean Practice’, in *26th Annual Conference of the International. Group for Lean Construction (IGLC),*. Chennai, India, pp. 442–451. doi: 10.24928/2018/0496.

Atkinson, R. (1999) ‘Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria’, *International Journal of Project Management*, 17(6), pp. 337–342.

Braun, V. and Clarke, V. (2006) ‘Using thematic analysis in psychology’, *Qualitative Research in Psychology*, 3, pp. 77–101. doi: 10.1191/1478088706qp063oa.

Bridges, D. *et al.* (2020) ‘Negotiating gender in the male-dominated skilled trades : a systematic literature review literature review’, *Construction Management and Economics*. Routledge, 38(10), pp. 894–916. doi: 10.1080/01446193.2020.1762906.

Building (2018) *Women in Construction survey views: sexism*, *Building.co.uk*. Available at: https://www.building.co.uk/focus/women-in-construction-survey-views-sexism/5091430.article (Accessed: 19 November 2020).

Caven, V. (2015) ‘Designing a career : Men and architecture’, in *25th Annual ARCOM Conference*. 7-9 September 2009, Nottingham, UK: Association of Researchers in Construction Management, pp. 617–26.

Caven, V. and Astor, E. N. (2013) ‘The potential for gender equality in architecture : an Anglo-Spanish comparison’, *Construction Management and Economics*, 31(8), pp. 874–882. doi: 10.1080/01446193.2013.766358.

Chivers, G. (2007) ‘Intervention Strategies to Increase the Proportion of Girls and Women Studying and Pursuing Careers in Technological Fields : a West European overview’, 3797. doi: 10.1080/03043798608939305.

Choi, J. O. *et al.* (2018) ‘An Investigation of Construction Workforce Inequalities and Biases in the Architecture, Engineering, and Construction (AEC) Industry Jin’, in *Construction Research Congress , ASCE*, pp. 65–75.

Clarke, L. and Gribling, M. (2010) ‘Obstacles to diversity in construction : the example of Heathrow Terminal 5 Obstacles to diversity in construction : the example of Heathrow Terminal 5’, 6193. doi: 10.1080/01446190802326776.

Clayton, S. D. (1992) ‘Remedies for discrimination: Race, sex and affirmative action’, *Behavioural Science & The Law*, 10(2), pp. 245–257. doi: https://doi.org/10.1002/bsl.2370100208.

Construction Manager (2017) *Sexism still rife in construction, survey finds*. Available at: https://www.constructionmanagermagazine.com/sexism-still-rife-construction-survey-finds/ (Accessed: 20 December 2020).

Cross, K. J. (2015) *The Experiences of African-American Males on Multiracial Student Teams in Engineering*. Blacksburg, Virgina.

Cudd, A. E. (2005) ‘How to Explain Oppression: Criteria of Adequacy for Normative Explanatory Theories’, *Philosophy of the Social Sciences*. SAGE Publications Inc, 35(1), pp. 20–49. doi: 10.1177/0048393104271923.

Dainty, A. R. J. *et al.* (2007) ‘The construction labour market skills crisis : the perspective of small – medium ‐ sized firms’, *Construction Management and Economics*, 6193. doi: 10.1080/0144619042000326738.

EIGE (2021) *Definition of gender bias*, *European Institute of Gender Equality*. Available at: https://eige.europa.eu/thesaurus/terms/1155 (Accessed: 6 January 2021).

Fielden, S. L. *et al.* (2010) ‘Women in construction : the untapped resource Women in construction : the untapped resource’, *Construction Management and Economics*, 18(1), pp. 113–121. doi: 10.1080/014461900371004.

Francis, V. (2017) ‘What influences professional women ’ s career advancement in construction’, *Construction Management and Economics*. Routledge, 6193, pp. 1–22. doi: 10.1080/01446193.2016.1277026.

Galea, N. *et al.* (2015) ‘Designing robust and revisable policies for gender equality : lessons from the Australian construction industry’, *Construction Management and Economics*. Routledge, 33(5–6), pp. 375–389. doi: 10.1080/01446193.2015.1042887.

George, M. and Loosemore, M. (2019) ‘Site operatives ’ attitudes towards traditional masculinity ideology in the Australian construction industry’, *Construction Management and Economics*. Routledge, 37(8), pp. 419–432. doi: 10.1080/01446193.2018.1535713.

Glick, P. and Fiske, S. (2001) ‘An ambivalent alliance: Hostile and benevolent sexism as complementary justifications for gender inequality.’, *American Journal of Psychology*, 56(2), pp. 109–118.

Glick, P. and Fliske, S. (1996) ‘The Ambivalent Sexism Inventory : Differentiating Hostile and Benevolent The Ambivalent Sexism Inventory : Differentiating Hostile and Benevolent Sexism’, (March). doi: 10.1037/0022-3514.70.3.491.

Griffiths, V. (2019) *Mind the gap, the gender pay gap*, *Association for Project Management*. Available at: https://www.apm.org.uk/blog/mind-the-gap-the-gender-pay-gap/ (Accessed: 29 December 2020).

Henderson, L. S., Stackman, Richard W and Koh, C. Y. (2013) ‘Women project managers : the exploration of their job challenges and issue selling behaviors’, 6(4), pp. 761–791. doi: 10.1108/IJMPB-06-2012-0033.

Henderson, L. S., Stackman, Richard W. and Koh, C. Y. (2013) ‘Women project managers: the exploration of their job challenges and issue selling behaviors’, *International Journal of Managing Projects in Business*. Emerald Group Publishing Ltd., 6(4), pp. 761–791. doi: 10.1108/IJMPB-06-2012-0033.

Hossain, J. B. and Kusakabe, K. (2011) ‘Sex segregation in construction organizations in Bangladesh and Thailand Sex segregation in construction organizations in Bangladesh and Thailand’, 6193. doi: 10.1080/01446190500127062.

Isaac, M. B. (2019) ‘How Pre-College Engineering and Technology Role Models See Them- selves Relate to Girls ’ Engagement in the Fields ? [ Research To Practice ]’, in *126th Annual Conference & Exposition, Charged up for the bext 125 years*.

Johnson, A. D. G., Manley, S. and Greed, C. (2005) ‘Diversity or the lack of it in the architectural profession Diversity or the lack of it in the architectural profession’, *Construction Management and Economics*, 23(10), pp. 1035–1043. doi: 10.1080/01446190500394233.

Jones, K. *et al.* (2014) ‘Negative consequence of benevolent sexism on efficacy and performance’, *Gender in Management : An International Journal*, 29(3), pp. 171–189. doi: 10.1108/GM-07-2013-0086.

Laplume, A. O., Sonpar, K. and Litz, R. A. (2008) ‘Stakeholder theory: reviewing a theory that moves us’, *Journal of Management*, 34(6), pp. 1152–1189.

Loosemore, M. and Lim, B. (2015) ‘Inter-organizational unfairness in the construction industry Inter-organizational unfairness in the construction industry’, *Construction Management and Economics*. Routledge, 33(4), pp. 310–326. doi: 10.1080/01446193.2015.1057193.

Lu, S. L. and Sexton, M. (2010) ‘Career journeys and turning points of senior female managers in small construction firms’, *Construction Management and Economics*, 28(2), pp. 125–132. doi: 10.1080/01446190903280450.

Maddaloni, F. and Davis, K. (2017) ‘The influence of local community stakeholders in megaprojects: Rethinking their inclusiveness to improve project performance’, *International Journal of Project Management*, 35(8), pp. 1537–1556. doi: 10.1016/j.ijproman.2017.08.011.

Maddaloni, F. Di and Davis, K. (2017) ‘The influence of local community stakeholders in megaprojects : Rethinking their inclusiveness to improve project performance’, *International Journal of Project Management*. Elsevier Ltd, APM and IPMA, 35(8), pp. 1537–1556. doi: 10.1016/j.ijproman.2017.08.011.

Mariam, A. T., Olalusi, O. B. and Haupt, T. C. (2020) ‘A scientometric review and meta- analysis of the health and safety of women in construction : structure and research trends’, *Journal of Engineering, Design and Technology*, In press. doi: 10.1108/JEDT-07-2020-0291.

McLoughlin, L. A. (2005) ‘Spotlighting: Emergent gender bias in undergraduate engineering education’, *The Research Journal for Engineering Education*, 94(4), pp. 373–381. doi: https://doi.org/10.1002/j.2168-9830.2005.tb00865.x.

Menches, C. L. and Abraham, D. M. (2007) ‘Women in Construction — Tapping the Untapped Resource to Meet Future Demands’, *Construction Management and Economics*, 133(9), pp. 701–707. doi: 10.1061/(ASCE)0733-9364(2007)133.

Muller, R. and Turner, R. (2010) ‘Leadership competency profiles of successful project managers’, *International Journal of Project Management*, 28(5), pp. 437–448.

Munns, A. K. and Bjeirmi, B. F. (1996) ‘The role of project management in achieveing success’, *International Journal of Project Management*, 14(2), pp. 81–87.

Pepper, A. (2013) *Feminism and Global Justice: Case for Cosmopolitanism*. The University of Sheffield.

Perrons, D. (2009) *Women and Gender Equity in Employment Patterns , progress and challenges*. WP23.

Pinto, J. K., Patanakul, P. and Pinto, M. B. (2017) ‘“The aura of capability”: Gender bias in selection for a project manager job’, *International Journal of Project Management*. Elsevier Ltd, 35(3), pp. 420–431. doi: 10.1016/j.ijproman.2017.01.004.

Powell, A. and Sang, K. J. (2015) ‘Everyday Experiences of Sexism in Male-dominated Professions : A Bourdieusian Perspective’, *Sociology*, 49(5), pp. 919–936. doi: 10.1177/0038038515573475.

Pritchard, S. and Miles, E. (2018) *Where are the women in major projects leadership ?*, *APM Research Fund Series*. UK.

Sabini, L., Muzio, D. and Alderman, N. (2019) ‘ScienceDirect 25 years of “ sustainable projects ” . What we know and what the literature says’, *International Journal of Project Management*. Elsevier Ltd and Association for Project Management and the International Project Management Association, 37(6), pp. 820–838. doi: 10.1016/j.ijproman.2019.05.002.

Sang, K. J. C., Dainty, A. R. J. and Ison, S. G. (2007) ‘Gender : a risk factor for occupational stress in the architectural profession ? Gender : a risk factor for occupational stress in the architectural profession ?’, *Construction Management and Economics*, 25(12), pp. 1305–1317. doi: 10.1080/01446190701546177.

Scott-young, C. M. *et al.* (2020) ‘Male and female mental health differences in built environment undergraduates undergraduates’, *Construction Management and Economics*. Routledge, 38(9), pp. 789–806. doi: 10.1080/01446193.2020.1748213.

Scott-young, C. M., Turner, M. and Holdsworth, S. (2020) ‘Male and female mental health differences in built environment undergraduates’, *Construction Management and Economics*. Routledge, 38(9), pp. 789–806. doi: 10.1080/01446193.2020.1748213.

Shamas-ur-Rehman, T. and Ogunlana, S. O. (2010) ‘Beyond the “iron triangle”: Stakeholder perception of key performance indicators (KPIs) for large-scale public sector development projects’, *International Journal of Project Management*, 28(3), pp. 228–236.

Styhre, A. (2011) ‘The overworked site manager : gendered ideologies in the construction industry’, *Construction Management and Economics*, 29(9), pp. 943–955. doi: 10.1080/01446193.2011.588955.

Taylor, A., Hamm, Z. and Raykov, M. (2015) ‘The experiences of female youth apprentices in Canada: just passing through?’, *Journal of vocational education & training*, 67(1), pp. 93–108.

United Nations (2021) *Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*. Available at: https://unstats.un.org/sdgs/report/2020/goal-08/ (Accessed: 10 January 2021).

Vachhani, S. J. and Pullen, A. (2019) ‘Ethics , politics and feminist organizing : Writing feminist infrapolitics and affective solidarity into everyday sexism’, *Human relations*, 72(1), pp. 23–47. doi: 10.1177/0018726718780988.

Varley, G. (2018) *Where are all the female construction workers?* Available at: https://www.womeninconstructionsummit.com/blog/where-are-all-the-female-construction-workers (Accessed: 21 April 2020).

Williams, M. and Polman, E. (2015) ‘Is It Me or Her ? How Gender Composition Evokes Interpersonally Sensitive Behavior on Collaborative Cross-Boundary Projects’, *Organization Science*, 26(2), pp. 334–355.

Appendix: List of studies articles

1. Agapiou, A. (2002) ‘Perceptions of gender roles and attitudes toward work among male and female operatives in the Scottish construction industry’, *Construction Management and Economics*, 20(8), pp. 697–705. doi: 10.1080/0144619021000024989.
2. Arroyo, P., Christensen, R. and Alves, T. (2018) ‘Impact of Gender Bias on Career Development and Work Engagement in the OAEC Industry and Lean Practice’, in *26th Annual Conference of the International. Group for Lean Construction (IGLC),*. Chennai, India, pp. 442–451. doi: 10.24928/2018/0496.
3. Bridges, D. *et al.* (2020) ‘Negotiating gender in the male-dominated skilled trades : a systematic literature review literature review’, *Construction Management and Economics*. Routledge, 38(10), pp. 894–916. doi: 10.1080/01446193.2020.1762906.
4. Cattell, K., Bowen, P. and Edwards, P. (2016) ‘Stress among South African construction professionals : a job demand-control-support survey’, *Construction Management and Economics*. Routledge, 34(10), pp. 700–723. doi: 10.1080/01446193.2016.1203967.
5. Caven, V. and Astor, E. N. (2013) ‘The potential for gender equality in architecture : an Anglo-Spanish comparison’, *Construction Management and Economics*, 31(8), pp. 874–882. doi: 10.1080/01446193.2013.766358.
6. Chivers, G. (2007) ‘Intervention Strategies to Increase the Proportion of Girls and Women Studying and Pursuing Careers in Technological Fields : a West European overview’, 3797. doi: 10.1080/03043798608939305.
7. Çınar, S. (2020) ‘Construction labour , subcontracting and masculinity : “ construction is a man ’ s job ”’, *Construction Management and Economics*. Routledge, 38(3), pp. 275–290. doi: 10.1080/01446193.2019.1690155.
8. Clarke, L. and Gribling, M. (2010) ‘Obstacles to diversity in construction : the example of Heathrow Terminal 5 Obstacles to diversity in construction : the example of Heathrow Terminal 5’, 6193. doi: 10.1080/01446190802326776.
9. Cross, K. J. (2015) *The Experiences of African-American Males on Multiracial Student Teams in Engineering*. Blacksburg, Virgina.
10. Dainty, A. R. J. *et al.* (2010) ‘A grounded theory of women ’ s career under- achievement in large UK construction companies A grounded theory of women ’ s career under- achievement in large UK construction companies’, *Construction Management and Economics*, 18(2), pp. 239–250. doi: 10.1080/014461900370861.
11. Fielden, S. L. *et al.* (2010) ‘Women in construction : the untapped resource Women in construction : the untapped resource’, *Construction Management and Economics*, 18(1), pp. 113–121. doi: 10.1080/014461900371004.
12. Francis, V. (2017) ‘What influences professional women’s career advancement in construction?’, *Construction Management and Economics*. Routledge, 35(5), pp. 254–275. doi: 10.1080/01446193.2016.1277026.
13. Galea, N. *et al.* (2015) ‘Designing robust and revisable policies for gender equality : lessons from the Australian construction industry’, *Construction Management and Economics*. Routledge, 33(5–6), pp. 375–389. doi: 10.1080/01446193.2015.1042887.
14. George, M. and Loosemore, M. (2019) ‘Site operatives ’ attitudes towards traditional masculinity ideology in the Australian construction industry’, *Construction Management and Economics*. Routledge, 37(8), pp. 419–432. doi: 10.1080/01446193.2018.1535713.
15. Glick, P. and Fiske, S. (2001) ‘An ambivalent alliance: Hostile and benevolent sexism as complementary justifications for gender inequality.’, *American Journal of Psychology*, 56(2), pp. 109–118.
16. Henderson, L. S., Stackman, R. W. and Koh, C. Y. (2013) ‘Women project managers: the exploration of their job challenges and issue selling behaviors’, *International Journal of Managing Projects in Business*. Emerald Group Publishing Ltd., 6(4), pp. 761–791. doi: 10.1108/IJMPB-06-2012-0033.
17. Hossain, J. B. and Kusakabe, K. (2011) ‘Sex segregation in construction organizations in Bangladesh and Thailand Sex segregation in construction organizations in Bangladesh and Thailand’, 6193. doi: 10.1080/01446190500127062.
18. Isaac, M. B. (2019) ‘How Pre-College Engineering and Technology Role Models See Them- selves Relate to Girls ’ Engagement in the Fields ? [ Research To Practice ]’, in *126th Annual Conference & Exposition, Charged up for the bext 125 years*.
19. Johnson, A. D. G., Manley, S. and Greed, C. (2005) ‘Diversity or the lack of it in the architectural profession Diversity or the lack of it in the architectural profession’, *Construction Management and Economics*, 23(10), pp. 1035–1043. doi: 10.1080/01446190500394233.
20. Jones, K. *et al.* (2014) ‘Negative consequence of benevolent sexism on efficacy and performance’, *Gender in Management : An International Journal*, 29(3), pp. 171–189. doi: 10.1108/GM-07-2013-0086.
21. Kyriakidou, O. (2012) ‘Retracted Article : Fitting into technical organizations ? Exploring the role of gender in construction and engineering management in Greece’, *Construction Management and Economics*. Routledge, 30(10), pp. 845–856. doi: 10.1080/01446193.2012.714870.
22. Lehr, J. L. and Laungs, M. (2015) ‘Liberal Studies in Engineering Programs – Creating Space for Emergent & Individualized Pathways to Success for Women in Computing Disciplines’, in *122nd ASEE Annual conference and exposition, June 14-17*. Seatle, WA.
23. Lingard, H. and Lin, J. (2004) ‘Career , family and work environment determinants of organizational commitment among women in the Australian construction industry’, *Construction Industry Institute*, 22(4), pp. 409–420. doi: 10.1080/0144619032000122186.
24. Lu, S. L. and Sexton, M. (2010) ‘Career journeys and turning points of senior female managers in small construction firms’, *Construction Management and Economics*, 28(2), pp. 125–132. doi: 10.1080/01446190903280450.
25. Mariam, A. T., Olalusi, O. B. and Haupt, T. C. (2020) ‘A scientometric review and meta- analysis of the health and safety of women in construction : structure and research trends’, *Journal of Engineering, Design and Technology*, In press. doi: 10.1108/JEDT-07-2020-0291.
26. Menches, C. L. and Abraham, D. M. (2007) ‘Women in Construction — Tapping the Untapped Resource to Meet Future Demands’, *Construction Management and Economics*, 133(9), pp. 701–707. doi: 10.1061/(ASCE)0733-9364(2007)133.
27. Perrons, D. (2009) *Women and Gender Equity in Employment Patterns , progress and challenges*. WP23.
28. Pinto, J. K., Patanakul, P. and Pinto, M. B. (2015) ‘Gender Biases in Hiring Project Managers: Perceptions of Trust and Likeability’, *IEEE Transactions on Engineering Management*, 62(3), pp. 1–10.
29. Pinto, J. K., Patanakul, P. and Pinto, M. B. (2017) ‘“The aura of capability”: Gender bias in selection for a project manager job’, *International Journal of Project Management*. Elsevier Ltd, 35(3), pp. 420–431. doi: 10.1016/j.ijproman.2017.01.004.
30. Powell, A. and Sang, K. J. (2015) ‘Everyday Experiences of Sexism in Male-dominated Professions : A Bourdieusian Perspective’, *Sociology*, 49(5), pp. 919–936. doi: 10.1177/0038038515573475.
31. Pritchard, S. and Miles, E. (2018) *Where are the women in major projects leadership ?*, *APM Research Fund Series*. UK.
32. Raiden, A. (2016) ‘Horseplay , care and hands on hard work : gendered strategies of a project manager on a construction site’, *Construction Management and Economics*. Routledge, 34(7–8), pp. 508–521. doi: 10.1080/01446193.2016.1182637.
33. Sang, K. J. C., Dainty, A. R. J. and Ison, S. G. (2007) ‘Gender : a risk factor for occupational stress in the architectural profession ? Gender : a risk factor for occupational stress in the architectural profession ?’, *Construction Management and Economics*, 25(12), pp. 1305–1317. doi: 10.1080/01446190701546177.
34. Schöttle, A., Christensen, R., & Arroyo, P. (2019). “Does Choosing by Advantages Promote Inclusiveness in Group Decision-Making?” In: Proc. 27th Annual Conference of the International. Group for Lean Construction (IGLC), Pasquire C. and Hamzeh F.R. (ed.), Dublin, Ireland, pp. 797-808. DOI: https://doi.org/10.24928/2019/0209. Available at: <www.iglc.net>.
35. Scott-young, C. M., Turner, M. and Holdsworth, S. (2020) ‘Male and female mental health differences in built environment undergraduates’, *Construction Management and Economics*. Routledge, 38(9), pp. 789–806. doi: 10.1080/01446193.2020.1748213.
36. Sinyai, C. and Choi, S. (2020) ‘Fifteen years of American construction occupational safety and health research’, *Safety Science*. Elsevier, 131(May), p. 104915. doi: 10.1016/j.ssci.2020.104915.
37. Smith, L. (2013) ‘Trading in gender for women in trades : embodying hegemonic masculinity , femininity and being a gender hotrod’, *Construction Management and Economics*, 31(8), pp. 861–873. doi: DOI: 10.1080/01446193.2013.833339.
38. Sospeter, G. and Rwelamila, P. D. (2014) ‘Review of Theory and Practice Literature on Women Entrepreneurship in the Tanzanian Construction Industry : Establishing the Missing Link’, 19(2), pp. 75–85.
39. Styhre, A. (2011) ‘The overworked site manager : gendered ideologies in the construction industry’, *Construction Management and Economics*, 29(9), pp. 943–955. doi: 10.1080/01446193.2011.588955.
40. Vachhani, S. J. and Pullen, A. (2019) ‘Ethics , politics and feminist organizing : Writing feminist infrapolitics and affective solidarity into everyday sexism’, *Human relations*, 72(1), pp. 23–47. doi: 10.1177/0018726718780988.
41. Williams, M. and Polman, E. (2015) ‘Is It Me or Her ? How Gender Composition Evokes Interpersonally Sensitive Behavior on Collaborative Cross-Boundary Projects’, *Organization Science*, 26(2), pp. 334–355.
42. Wright, T. (2013) ‘Uncovering sexuality and gender : an intersectional examination of women ’ s experience in UK construction’, *Construction Management and Economics*, 31(8), pp. 832–844. doi: 10.1080/01446193.2013.794297.
1. As written in the first page, we have this limitation only for EURAM, when this paper will be upgraded to a full journal publication we will review all Scopus [↑](#footnote-ref-2)