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DO JOB ADVERTISEMENTS PROMOTE GENDER INEQUALITY IN THE CONSTRUCTION SECTOR?

Ralph Olusola Aluko[1], Olalekan Shamsideen Oshodi[2], Emmanuel Itodo Daniel[3]

[1]Department of Architecture, Olabisi Onabanjo University, Ogun State, Nigeria

[2]School of Engineering and the Built Environment, Anglia Ruskin University, Chelmsford, United Kingdom

[3]School of Architecture and Built Environment, University of Wolverhampton, Wolverhampton, United Kingdom

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Abstract

The poor performance of construction projects remains a topical issue in the academic field of construction management. Across the globe, statistical data indicates that the construction sector is male dominated. The observed inequality is linked to conflicts, which is one of the main reasons for the poor performance of construction projects. The current study aims to explore the differences between job adverts for male [construction manager] and female [social worker] dominated sectors of the economy by comparing word usage. Text mining was used to unearth the differences in the content of the job advertisements for these two roles. The findings indicate that masculine words [such as leader] are the most commonly used words in the job adverts for construction manager roles. The findings suggest that the content of job adverts seem to promote gender stereotypes associated with employment in the construction sector. Such gender cues may contribute to the gender differences in the construction workforce. Taken together, these findings suggest that there is a need to embed gender-neutral words in job adverts placed by construction sector.

1. INTRODUCTION

The quantity and quality of the workforce influences the outcome of construction projects. Despite the existence of policies targeted at making work inclusive, the construction sector remains male dominated. For instance, In the UK, Brown (2019) observed that 12% of the professionals in the construction sector are females. The construction workforce in the US is made up of 9.1% of females (Connley 2019). This data indicates that females are underrepresented within the construction sector. Some of the consequence of male domination in the construction sector includes high rates of conflicts (Loosemore and Galea 2008) and shortage of workforce due to inability to attract a gender-diverse pool of applicants, among others. Empirical evidence has linked conflicts to poor performance of construction projects (Zhang and Huo 2015). The poor performance of construction projects results in economic waste of scarce resources. Thus, there is a need to promote gender equity among the construction workforce for sustained growth of the construction sector and the economy.

A considerable number of literatures has been published in gender inequality in the construction sector. The perspective of construction workforce on strategies for promoting gender equity was evaluated in Dainty et al. (2001). A preference for office-based roles was observed among females working in the construction sector (Lingard and Francis 2004; Adeyemi et al. 2006). A review of 15 years of research indicates that work-life imbalance and inefficient human resource manager practice are the main barriers to career advancement among females working in the construction sector (Navarro-Astor et al. 2017). According to Oo et al. (2018), interest in construction and job opportunities are the main factors influencing career decisions among female construction management students. A large portion of these studies have focused on individual level factors that contribute to gender inequality in the construction sector. However, little is known about institution factors that may deter women from participation in the construction industry.

The study fills the gap in the current knowledge by investigating an institutional factor, i.e. wording used in job adverts that may contribute of women underrepresentation in the construction sector. The objective of the study is to answer the question: does the words used in job adverts reinforce gender inequality in the construction sector. Specifically, text mining was used to analyze job adverts in male [Construction] and female [Social work] dominated professionals. The outcome of the text analysis is compared. The paper contributes towards a better understanding of institution factors that dissuade women from participation in the construction sector.

1.1 Wording of Job Advertisements as An Institutional Contributor to Inequality

Research into word usage in job advertisement has a long history. In a seminal study, Bem and Bem (1973) demonstrated that the use of masculine linguistic form in job adverts discourage females from applying for such jobs despite been qualified. Based theory of symbolic attraction (Highhouse et al. 2007), an individual's decision to apply for a job depends on the alignment between cues [i.e. information contained in the advert] and social identify of the job seeker. For instance, the inclusion of certain statements, such as work-life balance, within job adverts could potentially increase gender diversity within the construction sector. Building on Bem and Bem (1973) study, Vervecken et al. (2013) showed the names ascribed to job roles influenced career decision among primary school students. Currently, the workforce in the construction sector is ageing and the labour shortage is prevalent. The construction sector can improve its supply of workers by attracting and retaining a gender diverse workforce.

Business organisations in the construction have developed and implemented several strategies to attract workers from different strata of the society. For instance, the inclusion of gender diversity and Equal Employment Opportunity (EE)) statements in job adverts fits with the social identify of women. The practice of use of EEO statements within the construction sector is limited (French and Strachan, 2015). The predominant use of masculine ("solid business sense" and "decisiveness") over feminine ("communication skills" and "creativity") words in job adverts deters women from applying for job roles in male dominated sectors (Born and Taris 2010). Other

studies (Gaucher et al. 2011; Wille and Derous 2018) have shown that the use of adjectives, such as competitive, associated with traits tend to discourage women from applying for job roles in male dominated sectors, such as construction. However, none of those studies have focused entirely on roles in the construction sector. The present study addresses that gap in the existing literature in the field of construction management.

RESEARCH METHOD

Several methods have been used to evaluate how wording of job adverts sustains gender inequality in male dominated professions. The methods used in previous studies include: (i) content analysis of archival data, (ii) experiments and (iii) focus groups, among others (Stidder 2005; Gaucher et al. 2011; Wille and Derous 2018). Each of these research methods have its advantages and disadvantages. However, the choice and suitability of a research approach is dependent on the problem under investigation (Wing et al. 1998) and the available data. In recent times, the volume of unstructured data has grown rapidly. For example, the number of jobs advertised on online platforms, such as indeed.com, has increased significant. The use of text mining as a tool for the analysis of unstructured data, i.e. text, has provided valuable insights into problems and generated real-world solutions. For instance, text mining was used to analyse online hotel reviews in (Berezina et al. 2016). As a proven method, text mining was adopted in the current study to analyse word usage in job advertised for male (construction) and female (social work) dominated roles.

The study was carried out in four distinct phases. First, the research problem, i.e. word usage in job adverts, was defined at the start of the project. Second, the proportion of males and females employed in each sector of the economy was evaluated. Based on the information available on the webpages of the Office for National Statistics (UK) and the Bureau of Labor Statistics (US), the data revealed that the construction industry is male dominated and social work is a female dominated profession. For instance, over 80% of the social workers in the US are females (US Bureau of Labor Statistics 2019). Third, the job adverts relating to these two sectors were extracted from Indeed's website using web scraping. Data relating to 1594 (797 – construction manager and 797 social worker) job adverts were collected for this study. Finally, the adverts were used to create two-word corpora that were analysed with text mining techniques. A comprehensive list of masculine and feminine words that were presented in (Gaucher et al. 2011) served as the basis for identifying gendered wording in adverts. This approach is consistent with the methods used in previous research to evaluate differences in words used in job adverts (Gaucher et al. 2011; Newman et al. 2008). The findings emerging from the text analysis of the job adverts from the two sectors were compared to address the research question stated in the opening sector of this paper.

RESULT

Frequency of masculine words used in "construction manager" and "social worker" job ads

The final analysis focused on 41 masculine 40 feminine words as stated in (Gaucher et al., 2011). The top 10 frequently used masculine words in the job adverts are presented in Table 1. Based on the frequency of mention, lead* (1217), individual* (491) and analy* (490) are the top 3 frequently used words in job adverts for construction management roles (The frequency of occurrence for each word is in brackets). In contrast, the top 3 most frequently used words in job adverts for social work roles are individual* (907), determin* (336) and lead* (272).

Table 1: Masculine words most likely to appear in construction manager (CM) and social worker (SW) job ads

Word	Frequency in CM job ads	Rank	Frequency in SW ads	Rank
Lead*	1217	1	272	3
Individual*	491	2	907	1
Analy*	490	3	132	6
Decision	205	4	158	5
Objective	200	5	85	10
Challen*	185	6	78	11
Compet*	179	7	120	7
Independen*	162	8	269	4
Determin*	152	9	336	2
Principle*	115	10	97	9

Note: CM = Construction Manager, SW = Social Worker

Frequency of feminine words used in "construction manager" and "social worker" job ads

The frequency of usage of feminine word in job adverts was also investigated. The top 10 frequently used feminine word in job adverts are shown in Table 2. The top 3 most frequently used feminine words in social worker job ads are support* (1192), respon* (1101) and child* (941). In contrast, the top 3 most frequently used feminine words in construction manager job ads are respon* (1815), support (958) and (understand*).

Table 2: Feminine words most likely to appear in construction manager (CM) and social worker (SW) job ads

Word	Frequency in CM ads	Rank	Frequency in SW job ads	Rank
Support*	958	2	1192	1
Respon*	1185	1	1101	2
Child*	15	13	941	3
Understand*	537	3	355	4
Emotiona*	9	15	352	5
Commit*	376	4	254	6
Depend*	60	7	104	7
Interpersonal	130	5	90	8
Connect*	55	8	87	9
Compassion*	4	17	85	10

Note: CM = Construction Manager, SW = Social Worker

Commonality and comparison of 'construction manager' and 'social worker job ads

The corpora of construction manager and social work job ads were compared to identify the most commonalities and differences in word usage. The commonality word cloud for construction manager and social worker job ad is presented in Figure 1. The most frequent words are "work", "experience" and "required". These words are associated with job advertisements. For instance, employers may require some numbers of years of work experience from potential job seekers.

Figure 1: The most common words in 'construction manager' and 'social worker' job ads (Note: The font size of each word represents the frequency of usage of the particular word)

The corpora of the two job adverts were compared to identify the words that are less likely to be mentioned in the job adverts for construction manager roles. The outcome of the analysis is presented in a word cloud (see Figure 2). Also, the frequency of the top 10 most frequently used words in social worker job ad were compared with those for the construction manager role. The frequency of the most used words is shown in Table 3. Does the use of masculine words reinforce gender inequality in the construction sector? Indeed, the results of the text analysis suggest that the greater use of masculine words in job adverts could be responsible for the gender inequality observed in the construction sector.

Figure 2: A comparison cloud showing contrasting words between 'construction manager' and 'social worker' job ads (Note: The font size of each word represents the frequency of usage of the particular word)

Table 3: Words most likely to appear in social worker job ad than in construction manager job ads

Word	Frequency in SW job ads	Frequency in CM ads
Services	2160	451
Care	1998	118
School	1690	124
Health	1601	255
Education	1345	381
Community	1230	170
Families	1214	7
Students	1130	35
Family	1083	70

DISCUSSIONS

Very little is known about institution level factors that could be barriers to entry of females into the construction sector. The main objective of the study reported here is to investigate whether word usage in job adverts contribute to gender inequality in the construction sector. One interesting finding is that masculine words, such as lead*, analy*, decision, objective and challen*, are the prevalent words used in adverts for construction manager roles. In contrast, feminine words, such as child*, emotiona* and compassion*, are prevalent in the job adverts for social worker role. Surprisingly, it was found that feminine words, such as support* and responsive*, were commonly used in adverts for construction managers role. The outcome of this study seems to confirm the theory of symbolic attraction. The presence of masculine words in job adverts for construction roles could be perceived as threats to social identity of females. This phenomenon may be partly responsible for the male stereotype associated with the jobs in the construction sector.

The findings presented in this study is consistent with those observed in earlier studies. For instance, Vervecken et al. (2013) found that the presence of gender cues, such as masculine words, was responsible for females' lack of interest in male dominated professions. Gaucher et al. (2011) showed that the presence of words, such as leader, in job adverts could be linked to gender inequality in male-dominated job roles. Also, the presence of masculine words in job adverts made selectors believe that females were not suitable for these job roles (Horvath and Sczesny 2016). It could be argued that the positive results could be linked to that fact that only two job roles, i.e. construction manager and social worker, were compared. Also, it may be possible that females are not interested in job roles in the construction sector due to the nature of the job. For example, Adeyemi et al. (2006) stated that females are more interested in office-based than site-based job roles. Despite all of this, it was observed that feminine words, such as Commit*, care and compassion, were frequently used in job adverts for social worker roles. This observation may support the hypothesis that the presence of these gender cues can explain the interest and dominance of females in social worker job roles.

CONCLUSIONS

The present study set out to determine the effects of gender cues on the interest of women in job roles in the construction sector. It was found that the use of masculine words in job adverts is a popular practice in the construction sector. Also, the use of feminine words is a widespread practice in the job advertised for social worker roles. Taken together, these results suggest that the use of gender cues, i.e. words in job adverts, that females identify with could address the gender inequality in the construction sector.

The findings of the present study confirm the theory of symbolic attraction. This finding is because female seem to be less willing to apply for job roles that contain gender cues associated with masculine traits. The present study has provided new understanding into the underlying reasons for gender inequality in the construction sector. Being limited to text analysis of job adverts, the present study did not evaluate the effect of word usage on career decision among potential job applicants. Despite this limitation, the study offers some insights into the institutional factors that may be responsible for the gender inequality observed in the construction sector. Future research could be conducted to examine the effect of gendered wording in job adverts on the decision to apply for job roles among job seekers. Greater efforts are needed to ensure that the "right words" are used in job adverts for construction roles. The use of such words has the potential to attract a gender diverse pool of workers to the construction sector. The adequate supply of workers to the construction sector is essential for the long-term survival of construction firms.

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