

Perceptions of masculinity in the Australian construction industry

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Abstract

There is a widely accepted assumption in the construction literature that the industry is highly masculinised. This is based on considerable evidence accumulated over a considerable time, which points to the dominance of males at both operative and managerial levels, significant barriers to career progression for women into senior management roles and the existence, tolerance and even acceptance of normative behaviour which offends, subjugates and degrades women. While this evidence is both disturbing and compelling, there has been a surprising lack of empirical evidence around the nature of masculinity in the sector. Addressing this lack of research, a survey of one hundred and fifty-six construction site workers in Australia, indicates that masculinity in construction may be more inclusive and less hegemonic than is widely thought and that the level and nature of masculinity in the construction industry reflects trends in the wider population. It is found that the focus of masculinity in the construction industry is closely related to the physical and high-risk nature of work and that sexuality and humour may also be an important source of masculine identity. It is also found that there may be significant differences between the way that men and women in the industry define masculinity and that ethnicity and time spent in the industry also plays a role. These results are important since they contribute a more nuanced understanding into the dimensions and exact nature of masculinity in the construction industry. It is concluded that future research into the role of masculinity in areas such as gender diversity, safety and mental health would benefit from a more inclusive theoretical lens which recognises the dynamic nature of masculinity and which highlights the institutional legacies of past hegemonies that have to be challenged to move the industry forward.

Keywords: Diversity, gender, hegemony, inclusivity, masculinity, corporate social responsibility.

Introduction

Khan (2011:2) defines masculinity as a “complex cognitive, behavioural, emotional, expressive, psychosocial and socio-cultural experience of identifying with being male.” According to Connell (1995) and Howland et.al (2016) in western cultural traditions perceptions of masculinity are deeply entrenched and gender-divided, in that they are normally associated with men and stereotypical male behaviour which typically involves: self-reliance and independence; suppressing and denying emotions, vulnerabilities and weaknesses (restrictive emotionality); showing physical and mental toughness; being aggressive, successful and competitive; achieving high status; having non-relational attitudes towards sexuality; being courageous and taking risks; being humorous and playful; being the bread-winner; protecting and providing for families; and seeing homosexuality as threatening, unnatural and only for a minority of men who identify as queer.

These expectations are in a constant state of flux as societal expectations around gender roles change over time (Speer 2001) and translate into western political and workplace institutions which define the formal and informal processes, practices, roles and norms that men and women are expected to play in society and in workplaces such as construction sites, from a very young age. For example, Hancock (2012) notes how work has long been recognised as an integral part of a man's identity and how many young males (even as young as five) tend to focus on jobs which will allow them to meet the societal role of being masculine and which they believe will be accepted amongst other males and seen as acceptable positions for men to hold in society (Hancock, 2012). This has been put by numerous authors as a major reason why the construction industry is a predominately male workplace environment. The construction industry is traditionally associated with highly masculine traits of heavy and arduous physical work (Lowstedt et.al 2016:681) and a macho culture of risk-taking behaviour, bravado and high levels of physical exertion and male social closure (Ankrah et al 2009, Rawlinson and Farrell 2008, Chan 2011). This masculinised culture has in-turn shaped and maintained highly gendered work structures, practices, processes, roles, norms and even language (both formal and informal) which have acted to disadvantage and exclude women from the construction workplace at all levels apart from administrative and support roles where female representation tends to focus (Dainty et al 2000, Galea and Loosemore 2006, Galea et al 2015). It has been widely recognised that there is little support (and often social isolation) for men or women who wish to speak out against these practices and norms and any behaviour "viewed as in keeping with the industry's tradition" (Farrell and Rawlinson 2008:1097). However, it is also interesting that according to Smith (2013), being outside the expectations of masculine cultures has also allowed women to use their gender as a unique resource to work more smartly and more safely than other men who have to conform to these cultural norms.

According to Styhre (2010: 943) "...the very practice and discipline of management rests on masculine ideologies" and this is deeply etched into the construction industry's culture, to the extent that masculine ideologies are 'infrastructural' and a taken-for granted part of the industry's social fabric. Indeed, Styhre (2010) argues that masculine ideologies are so deeply embedded within the construction industry's practices, that it is rarely questioned and it also rewards those who promote masculine qualities without questioning the many negative consequences it has on the industry's performance. Research into the consequences of this masculinised work environment for those who work in the construction industry shows that there are many negative impacts for both men and women, but especially for women and other minority groups who do not conform to these norms. For example, the masculine nature of construction has been linked to relatively high levels of workplace conflict and bullying (Greed 1997, Raiden and Waters 2008), poor safety (Lacuone 2005), poor mental health (stress, anxiety, depression and suicide) (Santorella 2016, Anderson et al 2010 Burnside et.al (2015), poor work-life balance and long hours of work, presenteeism and total availability (Lingard and Francis 2007, Galea et al 2015), high levels of attrition and stalled career progression for women (Dainty et al 2000, Galea et al 2015), a career model that requires personal sacrifice and the strict separation of work and private/family responsibilities (Watts 2007), high levels of sexism, racism, discrimination and the marginalisation of minority groups (Loosemore and Chua 2002, Chan 2013, Burnside at.al 2015); and a

workplace culture that allows men to foster behaviours and actions which would otherwise be offensive and unacceptable in a 'normal' workplace environment such as excessive alcohol consumption, horseplay, misogyny, swearing, pornographic imagery and making inappropriate sexual comments (Caven 2009, Chan 2011). It is argued that this highly masculinised culture is not only bad for individuals working in construction at both professional and operative levels but that it is also bad for business with many negative organisational impacts such as absenteeism, poor morale, workplace conflict, low engagement and general discontent, lower productivity and efficiency, poor safety and poor quality (Farrell and Rawlinson 2008, Kim and Philips 2014 Raiden and Waters 2008, Andersen et.al 2015).

Surprisingly, despite all this research into masculinity and its negative individual and organisational consequences, there has been no attempt to empirically measure it. It appears that the gradual accumulation of evidence around the existence of the undeniable dominance of males at all level of the industry and the difficulties and barriers that women face, have been taken as incontrovertible evidence that the industry does indeed have a highly masculinised culture compared to other sectors and that this is hegemonic in acting to sustain the dominance of men in positions of power. The aim of this paper is to address this critically important gap in knowledge by addressing two key research questions: Is the construction industry a highly masculinised industry?; and how does masculinity manifest itself?

Theorising masculinity

One of the most widely used theories in the field of masculinity is Connell's (2005) Gender Order theory which introduced the concept of hegemonic masculinity by drawing on Marxist theories of cultural hegemony developed to explain the maintenance of power by certain groups in society (Speer 2001). According to Connell (2005), hegemony is a useful way to conceptualise the patterns of practices in society and organisations that legitimize, support and permit men's dominant position and justify the subordination of women, and other non-masculine behaviours and ways of being a man. The concept of hegemonic masculinity asserts that to maintain a perception of masculinity in society, a person must behave in ways which conform to social expectations of what masculinity means (aggressiveness, competitiveness, dominance, control, assertion etc). Furthermore, those who act out these norms will tend to isolate and label minorities such as homosexuals and women as 'out-groups' in order to reduce threats to dominant behavioural norms and social structures which maintain men's power in society. While most research in this area focuses on how women and minority groups such as homosexuals can suffer at the hands of hegemony, other men who do not conform to these norms can also suffer. For example, both O'Neil (2008) and Swift and Wahto (2016) point to significant negative cognitive, emotional and behavioural consequences for men who do not perfectly fit the masculine mold due to 'gender role conflicts' which can lead to feelings of inadequacy, weakness, internal conflict and a diverse spectrum of mental health problems, including stress, social isolation, anxiety and depression.

The concepts of hegemony and hegemonic masculinity have been mobilised by a number of authors in the field of construction to describe the construction industry's culture in various research contexts such as gender, diversity and safety (Lacuone 2005, Thorpe-Jones et al 2010, Loosemore et al 2011, Galea et al 2015). For example, Lacuone (2005:254) argued that hegemonic masculinity was prevalent in

the construction industry and that “Hegemonic masculinity in the construction industry is developed in conjunction with femininities and subordinated masculine configurations such as effeminate gender performances. The heterosexual man’s self-identity depends on his dislike of these other gender constructs.”

However, as with all theories, the concept of hegemonic masculinity is not without its critics. For example, Haywood and Mac an Gahill (2012) argue that the theory of hegemonic masculinity is analytically limited, because it excludes the complexity of different, and competing, forms of masculinity that exists in all societies and organisations. Similarly, in a construction context, Lowstedt et.al (2016) warn that in using the theory there is a danger in assuming that hegemonic masculinity is carried out by all men when it is not. This position is supported by Chan (2013) who also argues that conventional hegemonic masculinity, while present in the construction industry, is not the only form of masculinity that exists and that its use as a theory can ignore the presence of other non-hegemonic forms of masculinity such as those found in homo-social contexts, which can also serve to exclude both men and women. As Chan (2013:819) states, “Reinforcing the normative idea of masculinity in construction avoids closer scrutiny of ‘configuration[s] of gender practice’, and neglects an array of alternative masculinities at play, and the possibilities of counter-hegemonic forces that can be used to resist stigmatization and marginalization of minorities.” Another limitation of hegemonic masculinity is its inability to reflect differing attitudes towards masculinity between cultural groups (Hofstede (2016). For example, using the ‘Bem Sex Role Inventory’ which asks respondents to relate adjectives to notions of femininity and masculinity, Leung and Moore (2003) found that Chinese people tend to associate masculinity with attributes such as being modest, caring while Anglo-Australians associate masculinity with attributes such as ambition and competitiveness. As Halter et.al (2013:393) states, “...the dominant masculinity ideology in any given culture informs socialisation processes that encourage and constrain males to conform to...male role norms.”

However, arguably the greatest criticism of hegemonic masculinity is that it has been undermined and outdated by contemporary changes in attitudes towards masculinity in many societies, which ensure that men no longer need to behave in hyper-masculine ways in order to be accepted as masculine and can openly engage in a variety of behaviours which would have previously been classed as feminine without the fear of being perceived as gay or weak (Andersen 2009, Anderson & McGuire 2010). In particular, as Levant & Richmond (2007) note, younger people are especially receptive to exploring their gender in different ways. Clearly, changes in attitudes towards masculinity do not move at a uniform pace across all cultural and indeed industry groups and according to O’Neill (2015: 104) hegemonic masculinity only describes the operation of masculinities in cultures of high homophobia and older generations and does not reflect “recent shifts in the social and cultural landscape have brought about the development of more ‘inclusive’ or non-homophobic forms of masculinity.” Indeed, the need for a more inclusive approach to masculinity has been recognised by a small number of construction researchers, although none have mobilised the theory as a conceptual lens in the construction sector (Agapiou 2010, Rumens 2013, Chan 2013). Nevertheless, these researchers are important since they recognise that attitudes towards masculinity, gender and sexuality are likely to be varied across the construction industry and are constantly shifting and that they should not be treated as uniform and stable.

Methodology

Undertaking research into the way that masculinity manifests itself in the construction industry poses a number of methodological challenges. As McCosker et.al (2001:02) points out, all research into personal and sensitive topics such as masculinity “creates both methodological and technical issues for the researcher” in that respondents may not answer questions honestly because they know what the right answer ‘should be’ (social desirability bias) and the research process itself may adversely affect potential respondents, especially those struggling with masculinity in their personal lives. In this research, these risks were minimised in a number of ways: by ensuring anonymity to all respondents; by using well-developed research tools which have been tried and tested in the research environment; and by approaching respondents through a trusted source. We also ensured that all respondents were informed about the aims of the survey process, the background of the research being conducted, the potential uses of the research and were offered help to address any psychological impacts caused (Newman et al 2006).

Employing these strategies, the method of data collection chosen for this thesis was an anonymous voluntary online survey of construction workers in Australia using a widely tested instrument called the Male Role Norm Inventory Scale Short Form (MRNI-SF) which has been developed to measure attitudes towards traditional masculinity ideology and non-traditional male norms (Levant and Hall 2013). The (MRNI-SF) was chosen over other instruments as the tool to measure attitudes towards masculinity for a number of important reasons. For example, the Masculine Behaviour Scale (MBS) created by Snell (1989) measures attitudes towards four traditional masculine traits: restrictive emotionality, inhibited affection, success dedication and exaggerated self-reliance on a 5-point Likert scale. However, it wasn't suitable for this study since it was designed specifically to compare male and female attitudes. Alternatively, the Brannon Masculinity Scale (Thompson, et al. 1985), uses a 7-point Likert Scale to measure how people feel about traditional masculinity across seven subscales: Avoiding Femininity, Concealing Emotions, Being the Breadwinner, Being Admired and Respected, Toughness, The Male Machine and Violence and Adventure. However, the Brannon Masculinity Scale consists of 110 items (although there is a shortened version with 58), which would have been too demanding for our busy respondents who are also not familiar with completing surveys in the little free time they have. Furthermore, the Brannon Masculinity Scale has been criticised by Levant and Richmond (2007) for its overlapping questions in the various sub scales and its failure to include negativity towards sexual minorities and the importance of sex, which were considered fundamental male role attributes.

The Male Role Norm Inventory Scale Short Form (MRNI-SF) used in our study was created by Levant et.al (2013) as a research instrument which measures attitudes towards masculine ideology and gender role strain. The basis of the MRNI-SF is a 57-item instrument called the Male Role Norms Inventory Scale which is divided into seven subscales: Avoidance of Femininity; Fear and Hatred of Homosexuals; Self-Reliance; Aggression; Achievement/Status; Non-Relational Attitudes Toward Sex; and Restrictive Emotionality (Levant & Richmond 2007). This was revised in 2007 and again in 2010 into a 39-item instrument called the MRNI-Revised scale with new subscales: Avoidance of Femininity, Negativity toward Sexual Minorities, Self-Reliance through Mechanical Skills, Toughness, Dominance, Importance of Sex and Restrictive Emotionality (Levant et.al 2013). The latest iteration of this instrument is

the Male Role Norms Inventory Scale – Short Form (MRNI-SF) (Levant et al. 2013) which is a shorter but equally rigorous instrument which can be applied in the sorts of time-pressured organisational settings which our research was being conducted in. Levant et al (2013) created the MRNI-SF through a factor analysis of the three highest loading items from each subscale, removing any overlaps of questions which resulted in a total of a 21-item instrument across seven subscales. Avoidance of Femininity (Evading any acts or behaviours considered traditionally feminine); Negativity towards Sexual Minorities (Promoting and expressing negative attitudes towards minority groups, particularly of the sexual nature); Self-reliance (Associating independence with one's ability to be successful in acquiring traditional masculine skills); Toughness (Placing significance on males' ability to show physical and emotional strength); Dominance (The belief males should hold dominant roles in society); Importance of Sex (Placing significance and expectations on males' interests in sexual behaviours); Restrictive Emotionality (Difficulty in expressing one's feelings). The MRNI-SF instrument uses a 5-point Likert scale with higher scores indicating support for traditional masculinity (Levant et al. 2013).

While the construction industry in Australia is dominated by males at both professional and operative levels, we focussed on operatives. While research is also needed at professional levels, where there are only 14% of management roles filled by women, the under representation of women at operative level is even more serious at 3% (ABS 2012). Operatives were defined as any person who worked on a construction site in a tradesperson, labouring and supervisory role and were randomly sampled from a selection of construction sites in the Sydney state of New South Wales with the assistance of the largest construction union in Australia which represents a broad range of trades in the industry (The Construction, Forestry, Mining and Energy Union). After gaining ethics clearance from the administering university, the sampling process involved the CFMEU randomly sending emails in the survey working on a wide range of projects and for a wide range of small and large companies in the state of New South Wales. In this invitation email, potential respondents were provided with an online web link to the survey with an explanation of what the survey involved, why it was being conducted and how the respondents could withdraw their data at any point, including after they had submitted their survey. Offers of advice were also offered to those who experienced any discomfort in undertaking the survey.

An online survey was used for four main reasons. First, as discussed above, given that we were enquiring about masculinity, an online survey afforded anonymity to our respondents, minimising personal exposure, maximising our response rate and minimising social desirability bias in our results (Sarniak 2015). Second, face-to-face interviews would have been prohibitively time consuming given the geographical distribution and size of our population. Third, this approach to data collection suited the busy lives of our target respondents who were all full-time operatives working on construction sites in numerous locations which involved significant hours in travel time.

Like all methods, it is recognised that electronic surveys have their limitations. For example, although one may have access to greater numbers of participants, there is no way to determine whether targeted respondents complete the survey and whether the resultant sample is representative. However, Cooper's (2000) research into the merits and disadvantages of online surveys shows that self-selection is no more

problematic in online surveys than in mail and telephone surveys and Gosling et al.'s (2004) research showed that they also compare favourably to other published findings with respect to gender, socioeconomic status, geographic location, age, and race.

The on-line survey comprised three sections and was pilot tested and refined before distribution. The first section consisted of demographic questions which our research indicated could be related to attitudes towards masculinity such as age (Berger and Levant 2005), gender (Levant et al 2003), ethnicity (Courtenay 2000), trade/profession (Lacuone 2005), ages and period working in the industry (Marchant 2014), education (Barr & Mason 2006), postcode (Merritt and Turner 2013), span of control (Rumors 2012). The second section drew on the Male Role Norm Inventory Scale Short Form which, as discussed above, is a measuring instrument consisting of 21 items, categorised into seven subscales which measure traditional masculinity ideology and non-traditional male norms on a five-point Likert Scale (Levant & Hall 2013).

The above research strategy resulted in 156 completed and useable surveys being returned providing a statistically representative sample which is strong for studies in applied psychology (Marszalek et al 2011). The detailed sample structure is illustrated in Table 1.

Table 1 Sample structure

Description	Frequency	Percentage
Gender		
Male	148	94.9
Female	6	3.8
Prefer not to say	1	0.6
N/A	1	0.6
Age		
<20	2	1.3
21-30	43	27.6
31-40 years	49	31.4
41-50 years	33	20.5
51-60 years	21	14.1
60+	8	5.1
Ethnicity		

Aboriginal/Torres Strait Islander	8	5.1
African	1	0.6
Anglo Saxon/Australian	81	51.9
Asian	1	0.6
Middle Eastern	4	2.6
European/UK	33	21.2
New-Zealand/Pacific Islander	13	8.3
Hispanic/Latino	2	1.3
N/A	13	8.3
Education		
Year 7-8	5	3.2
Year 9-10	29	18.6
Year 11-12	41	26.3
TAFE / Diploma	50	32.1
Bachelor/Masters Degree	13	8.3
Not Specified	18	11.5
Trade		
Trade	40	25.6
Labourer	12	7.7
Plant Operator	37	23.7
Safety/First Aid	4	2.6
Other	49	31.4
Supervisor/Manager	7	4.5
N/A	7	4.5
Span of Control		
0	75	48.1
1-5	48	30.8
6-10	12	7.7
11-15	5	3.2
16+	10	6.4
N/A	6	3.8
Duration in Trade		
<6 months	1	0.6
6 months – 1 year	3	1.9
1-5 years	35	22.4
5-10 years	34	21.8

10-15 years	28	17.9
>15 years	55	35.3
TOTAL	156	100

Male respondents dominated the sample (94.9%) closely reflecting ABS (2012) statistics around female representation at construction trade level. While a range of ethnic groups were represented, most respondents were of Anglo Saxon/Australian background (51.9%), which contrasts with previous studies of ethnicity by Loosemore et al (2010) (also supported by the CFMEU) which shows high representations from other ethnic groups such as Asians. The sample contained a good balance of age groups and reflects Australian Government statistics which shows that those aged between 21-50 years old make up most of the Australian workforce (ABS 2016). In terms of education, about half our respondents had undertaken further or higher education after leaving school and most (78%) were in non-supervisory or low level supervisory positions. Although a significant proportion of the sample were skilled tradespeople or plant operators (49%), a significant proportion (31%) classed themselves as 'other' which indicates non-qualified/unskilled roles.

Data was analysed using a range of descriptive and inferential statistical tests: One Sample T-Tests were used to understand the mean responses of respondents to the 21 MRNI-SF items; Independent T-Tests were used to understand the relationship between independent variables with two items (or less) against the dependent variable MRNI-SF items; ANOVA One-way Tests were used to understand the relationship between independent variables with two items (or more) against the dependent variable MRNI-SF items (for example, differences between students based on hours worked).

Results

Table 2 summarises the results for each of the MRNI-SF subscale questions for the whole sample. The higher the mean score the stronger the tendency towards masculine ideology and the lower the standard deviation the more consensus in the sample responses.

Table 2 The overall sample results for each MRNI-SF subscale question

MRNI-SF Dimension	Mean	Standard deviation
Restrictive Emotionality (RE)		
A man should never admit when others hurt his feelings	2.06	1.23
Men should be detached in emotionally charged situations	2.40	1.338
Men should not be too quick to tell others they care about them	2.37	1.354
Average Score:	2.28	1.307
Self Reliance through Mechanical Skills(SF)		
Men should have home improvement skills	3.76	1.411
Men should be able to fix most things around the house	3.71	1.441
A man should know how to repair his car if it should break down	3.03	1.446
Average Score:	3.50	1.433
Negativity toward Sexual Minorities (NT)		
Homosexuals should never marry	2.62	1.612
All homosexual bars should be closed down	2.06	1.294
Homosexuals should never kiss in public	2.67	1.491
Average Score:	2.45	1.466
Avoidance of Femininity (AF)		
Men should watch football games instead of soap operas	2.57	1.49
A man should prefer watching action movies to reading romantic novels	2.84	1.426
Boys should prefer to play with trucks rather than dolls	3.01	1.59
Average Score:	2.81	1.502
Importance of Sex (IS)		
Men should always like to have sex	3.24	1.47
A man should not turn down sex	2.67	1.433
A man should always be ready for sex	2.65	1.413
Average Score:	2.85	1.439
Dominance (DO)		
The President of the U.S. should always be a man	1.99	1.229
Men should be the leader in any group	1.97	1.199
A man should always be the boss	2.06	1.251
Average Score:	2.01	1.226

Toughness (TO)		
It is important for a man to take risks, even if he might get hurt	2.63	1.525
When the going gets tough, men should get tough	3.26	1.57
I think a young man should try to be physically tough, even if he's not big	2.82	1.466
Average Score:	2.90	1.520
Total Average Score:	2.69	1.413

Overall the rank-order results indicate that the focus of masculinity in our sample took the form of self-reliance (3.50), toughness (2.90), importance of sex (2.85), avoidance of femininity (2.81), negative attitudes towards sexual minorities (2.45), restrictive emotionality (2.28) and dominance (2.01). It is noteworthy that the total average score of 2.69 (on a scale of 1 -5) is surprisingly low given the significant amount of literature cited above, that portrays the construction industry as highly masculinised. As for the detailed dimensions of masculinity that emerged in our sample, the dominance of 'self-reliance' as a marker of masculinity is not surprising given that the questions within this sub-scale relate to ability to undertake mechanical tasks which correspond directly to the types of skills our respondents would possess. This result suggests that the nature of construction has a significant role to play in shaping perceptions of masculinity and that future interventions to address related issues such as gender diversity and equality where the industry performs worse than the general population (Galea et al 2015), might benefit by targeting this area. For example, this would tend to support as yet anecdotal arguments that the adoption of new production processes and technologies such as offsite assembly which reduce reliance on physical tasks can make a significant difference to addressing issues such as gender diversity in the construction industry (Gurjao 2007). The prominence of 'toughness' within our sample's definition of masculinity is also not surprising given the questions in this subscale refer to risk-taking and physical strength. This supports research outside of construction which highlights the importance of being seen to be tough in males who conform to traditional masculinity (Vescio and Weaver 2015, Berke et.al (2012). These findings also add further weight to recent research which suggests that a propensity towards physical risk-taking is a key characteristic of the construction industry. For example, Safe Work Australia (2015) found that construction workers were more likely than workers in other industries to agree that taking risks was a normal part of their daily work, that their workplace does not suit those overly concerned about risk, that risk taking at work is acceptable, especially if it means getting the project finished on time. More recently, Phua's (2017) comparative research into the risk-taking propensity of professionals who work in construction also found that the construction industry is attractive to physical risk-takers, which she argues has important implications for safety performance in the industry. The importance of sex as a form of masculine identity in our results also reflects recent research by Datta (2009), Rawlinson and Farrell (2010), Rumens (2013), Chan (2013), Wright (2013) and Galea et al (2017) which has provided ethnographic and other empirical evidence of overt sexuality, sexual story-telling, vulgar sexual behaviour and joking and even sexual harassment at play in construction site interactions between men, and men and women. As Datta (2009:2) showed, building sites are enclosed and confined

masculine spaces where industry-specific normative and heterosexual masculinities are practiced by workers who engage in varieties of gender performances that would normally be considered sexist and derogatory to women.... "These performances include pin-ups of nude women, sexist jokes, sexual boasting, sports-talk, as well as teasing and cat-calls to women who come near or pass by building sites". Beyond the obvious implications for women working in the industry, these results also indicate significant potential implications which need further research for marginalisation, harassment and discrimination towards other masculine outgroups in the construction industry such as homosexuals who have alternative sexualities. Having said this, while our respondents expressed moderately strong tendencies to avoid feminine behaviours, attitudes towards sexual minorities' such as homosexuals reflect Chan's (2011) exploration of sexuality in the construction industry which showed that although there are some overlaps between the experiences of women and gay men in the industry, there is also some evidence to challenge the belief that the macho image of the industry is not necessarily connected with homophobia. As Chan (2011: 215) states, "There is a sense that good work matters in construction and that recognition of this by peers, no matter of one's sexuality, is important. Yet Chan (2011) also argued that there is a sense of subversion of sexual identities and a clear separation between the privacy of sexual desires and the disclosure of sexual relations at the workplace. It is interesting that restrictive emotionality featured lowly in our responses indicating that masculinity is not expressed in construction through the restriction of emotions. The types of emotions used to act out one's masculinity need to be explored further. However, given our findings relating to a reluctance to act-out feminine behaviours, men's emotional expressions of masculinity are likely to be different to women's. For example, the work of Datta A (2009) indicates that humour plays an important role in defining masculinity in the construction industry, an avenue of investigation which is also supported by Watt (2007) who argues that humour acts as a form of resistance and refuge for minority groups and even acts to signify the boundaries between men and women in highly gendered environments like construction. Interestingly it also performs other important functions such as diffusing tension and resolving conflicts of the type that are often found in highly masculinised and pressured environments such as construction. Finally, it is interesting that the concept of male dominance received the least strongest support in our results, given the fact that the construction industry's leadership as both operative and managerial level is dominated by males. This result and the overall profile of masculinity presented above does not support studies which argue that hegemonic masculinity is an appropriate conceptual lens to describe the culture of the construction industry and which argue that men are a major barrier to gender diversity and equality in the construction industry. Rather, our results tend to support the conclusions of Agapiou (2010: 697) who argues that the construction industry at all levels is gradually accepting and accommodating efforts to address this problem.

In order to understand this further and to investigate whether this profile of masculinity is unique, we compared our results to other studies which have used the MRNI-SF outside the construction industry (see Table 3). The comparative studies, Hall et al (2016) and Levant et al (2013) sampled community-dwelling males and college men and undergraduates from a range of programs across six ethnicities and ages ranging from 18-72 years old.

Table 3 Comparison of findings with Hall et al (2016) and Levant et al (2013)

MRNI-SF dimension	Hall et.al (2016) MRNI-SF Results		This Study's MRNI-SF Results		Levant et.al (2013) MRNI-SF Results	
	Mean (rank)	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Restrictive Emotionality (RE)	2.62 (5)	1.47	2.28 (6)	1.31	2.40 (7)	1.00
Self-Reliance through Mechanical Skills(SF)	4.50 (1)	1.62	3.50 (1)	1.43	4.47 (1)	1.39
Negativity toward Sexual Minorities (NT)	1.96 (7)	1.43	2.45 (5)	1.47	2.74 (5)	1.46
Avoidance of Femininity (AF)	2.94 (3)	1.74	2.81 (4)	1.50	3.84 (3)	1.51
Importance of Sex (IS)	2.92 (4)	1.62	2.85 (3)	1.44	3.31 (4)	1.38
Toughness (TO)	4.03 (2)	1.69	2.90 (2)	1.23	4.38 (2)	1.23
Dominance (DO)	2.01 (6)	1.37	2.01 (7)	1.52	2.42 (6)	1.17
Total average score	2.95	1.56	2.69	1.41	3.36	1.31

Table 3 shows that compared to other studies in the wider population which have used the MRNI-SF instrument, our results have the lowest masculinity score (2.69). The variance between the mean scores in our study with the mean scores from Hall et al (2016) and Levant et al (2013) are listed in Table 4 for each dimension of the MRNI-SF scale and show an overall average variation of just 11.49%. This indicates that perceptions of masculinity in our sample do not differ significantly from perceptions in other studies with samples drawn from the general population. Taken together, these results tend to question studies in construction cited above, which have tended to assume that because the industry is highly male dominated compared to other industries that it must also follow that it is more masculinised. Our results suggest it is more nuanced than this and that on closer analysis, it is evident that the main difference is toughness (26.2%), the importance of self-reliance through mechanical skills (19.8%) and avoidance of femininity (11.6%). These differences make sense since these dimensions are among the most important dimension of masculinity in Table 1 (ranked 1, 2 and 4 respectively).

Table 4 Comparison of MRNI-SF scores for construction and general population

MRNI-SF dimension	Average 'mean score' difference (%)
Restrictive Emotionality (RE)	$0.12 + 0.34 = 0.23/5 = 4.6\%$
Self-Reliance through Mechanical Skills(SF)	$1.00 + 0.97 = 0.99/5 = 19.8\%$

Negativity toward Sexual Minorities (NT)	$0.49 + 0.29 = 0.39/5 = 7.8\%$
Avoidance of Femininity (AF)	$0.13 + 1.03 = 0.58/5 = 11.6\%$
Importance of Sex (IS)	$0.46 + 0.07 = 0.27/5 = 5.4\%$
Toughness (TO)	$1.13 + 1.48 = 1.31/5 = 26.2\%$
Dominance (DO)	$0.00 + 0.49 = 0.25/5 = 5.0\%$
Average total mean variation	11.49%

Table 5 illustrates the statistically significant differences in responses from the Independent Sample T-tests of the independent variable gender (male v. female) relationship with all 21 dependent variable items from the MRNI-SF instrument. To account for the large difference in males and females in our sample, the independent sample t-test was conducted with 'equal variances not assumed'.

Table 5 – Independent Sample t-Tests (Males v Females)

	Levene's Test for Equality of Variances		T-test for Equality of Means						
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Restrictive Emotionality									
A man should never admit when others hurt his feelings	4.963	0.27	4.748	9.386	.001	.927	0.195	.488	1.366
Men should be detached in emotionally charged situations	9.499	.002	6.458	10.242	.000	1.290	.200	.846	1.733
Men should not be quick to tell others when they care about them	9.368	.003	6.231	10.408	.000	1.249	.201	.805	1.694
Self Reliance									

Negativity toward Sexual Minorities										
All homosexual bars should be closed down	Equal variances not assumed	11.62 2	.001	10.3 02	148	.000	1.094	.106	.884	1.304
Homosexuals should never kiss in public	Equal variances not assumed	17.22 5	.000	7.51 2	11.67 9	.000	1.551	.207	1.100	2.003
Avoidance of Femininity										
A man should watch action movies to reading romantic novels	Equal variances not assumed	2.298	.132	3.15 4	5.762	.021	1.399	.444	.303	2.496
Boys should prefer to play with trucks rather than dolls	Equal variances not assumed	11.73 5	.001	7.02 9	9.472	.000	1.740	.248	1.185	2.296
Importance of Sex										
Men should always like to have sex	Equal variances not assumed	6.042	.015	4.43 0	6.644	.003	1.462	.330	.673	2.251
A man should not turn down sex	Equal variances not assumed	22.16 5	.000	14.8 64	148.0 00	.000	1.732	.116	1.501	1.962
Dominance										
The President of the U.S, should always be a man	Equal variances not assumed	10.68 0	.001	10.1 91	148	.000	1.034	.101	.833	1.234
Men should be the leaders in any group	Equal variances not assumed	8.291	.005	10.2 40	148	.000	1.013	.099	.818	1.209
A man should always be the boss	Equal variances not assumed	4.754	.031	4.76 3	9.536	.001	.934	.196	.494	1.374
Toughness										

When the going gets tough, men should get tough	Equal variances not assumed	13.403	.000	8.189	9.249	.000	2.016	.246	1.46	2.570
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Table 5 shows that there are thirteen dimensions of masculinity out of twenty-one in the MRNI-SF scale, where men and women respondents showed significantly different results. The areas of greatest divergence in rank order (average mean difference) were: toughness (2.016); importance of sex (1.597); avoidance of femininity (1.569); negative attitudes towards sexual minorities (1.322); restrictive emotionality (1.155); dominance (0.994); and self-reliance (0). Although the results need to be treated with some caution because of the small sample size for women, these results suggest that women in construction do not see masculinity in the same way as men. They may help to explain why many women fail to progress in the construction industry, even when adopting a male persona (Dainty et al 2000, Powell et al 2010, Chan 2011, Wajcman 1996) by enhancing our understanding of how this may be perceived by men in positions of power and why they are unlikely to be completely accepted as equal to men in this environment by adopting this strategy. Building on the work of Martin (2001) and Galea et al (2015), these results may also help in advancing our understanding of how gendered institutions (both formal and informal) in construction organisations makes masculine behaviour possible and acceptable for men but not for women and determines women's interpretations and experiences of these behaviours.

One-Way ANOVA tests of how perceptions of masculinity vary by role showed no significant differences, which is interesting given recent research being conducted by Choe and Leite (2017) and Lingard et al (2017) which shows differences in perceptions of safety risk between managers and workers and between certain trades. Any differences would have been expected to be reflected in our toughness dimension which directly addresses the issue of risk and our findings suggest that while some roles in the construction industry are perceived as riskier than others, this does not translate into how people in those roles see masculinity being acted-out in their work environment. In particular, it is interesting that perceptions of masculinity do not vary between trade and professional roles given the greater scrutiny given to gender diversity and equality initiatives at the professional level compared to site level in Australia (Galea et al 2015). If construction workers are taken as a control group, then this would suggest that recent initiatives have done nothing to shift relative attitudes towards masculinity at management level. This in-turn indicates that current initiatives to address gender diversity may be misdirected or at the very least, need to be broadened to change perceptions of masculinity.

Table 6 illustrates the One way ANOVA results for duration of experience in the industry.

Table 6 One-Way ANOVA test (Duration in industry)

	Sum of Squares	Df	Mean Square	F	Sig.
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Subscale:	Dominance				
The President of the US should always be a man	22.913	5	4.583	3.257	.008
Subscale:	Importance of Sex				
A man should not turn down sex	27.806	5	5.561	2.871	0.17
Subscale:	Restrictive Emotionality				
Men should be detached in emotionally charged situations	21.605	5	4.321	2.532	.031

One-Way ANOVA tests of the relationship between the duration respondents have spent within the construction industry and the MRNI-SF scale items indicated only three areas of significant statistical difference (Dominance, Importance of Sex and Restrictive Emotionality). In other words, the more time spent in construction the more important these dimensions become in defining one's masculinity with Post Ad-hoc tests showing significant differences between those respondents working 1-5 years and those working 10-15 years.

Table 7 illustrates the One way ANOVA results for ethnicity.

Table 7 One-Way ANOVA test (ethnicity)

	Sum of Squares	Df	Mean Square	F	Sig.
Subscale:	Restrictive Emotionality				
Men should be detached in emotionally charged situations	36.445	9	4.049	2.452	.012
Subscale:	Toughness				
It is important for a man to take risks, even if he might get hurt	39.753	9	4.417	2.011	.042

One-Way ANOVA tests of the relationship between the ethnicity of respondents and the MRNI-SF scale items indicated only two areas of significant statistical difference in toughness and restrictive emotionality. The Tukey post-hoc test demonstrates a significant difference between Aboriginal/ Torres Strait Islander and Anglo Saxon/Australian respondents (.030) and a difference between New-Zealander and Aboriginal Torres Strait Islander (.006). Australia construction sites are places of great ethnic diversity (Loosemore et al 2010) and these results were somewhat surprising given that attitudes towards masculinity are well known to vary between cultural and ethnic groups (Hofstede 1984) and as Datta (2009:4) notes, "masculinities are understood to be produced from their mutually constitutive relationships with other identities of class, race, nationality, and ethnicity that operate in different places."

Finally, there were no significant differences found between the age of our respondents and their perceptions of masculinity suggesting that the changing attitudes towards masculinity which underpin theories of inclusive masculinity are not related to age.

Conclusion

The aim of this paper was to address lack of empirical evidence around masculinity in the construction industry and to address two key research questions:

1. Is the construction industry a highly masculinised industry?
2. How does masculinity manifest itself in the construction industry?

The results indicate that masculinity in construction may be more inclusive and less hegemonic than has been widely argued. While this may have been different in the past when previous research was undertaken in this area, our results also indicate that the nature of masculinity in the construction industry is not significantly different to that in the wider population. Indeed, levels of masculinity, in both absolute and relative terms, may even be marginally lower. This is not to say that the industry is still left with the institutional legacy of past hegemony and our results indicate that this is likely to be a fruitful avenue for future research into the role of masculinity in related areas such as gender diversity, safety and mental health. However, our results do indicate that workers themselves may not be as great a barrier to gender equality and diversity as many have argued. Given we focused on workers in this research, we cannot comment on whether this is the same at management level where formal gendered institutions are created and maintained. Further research is needed here. The results also indicate that the focus of masculinity in the construction industry is closely related to the physical and high-risk nature of work, and that sexuality may also be an important source masculine identity. Our research supports recent calls for more research into this previously unexplored area and for management strategies to eradicate sexually explicit imagery, language and so-called humour on construction sites. Our results indicate that the role of gendered and sexualised humour in defining men's identity may be a particularly fruitful avenue of future investigation. This is an area which has also received scant attention in construction.

It was surprising that the need for men to dominate leadership positions featured lowly in our results, given the considerable imbalance in gender equity and power within the industry. Again, this highlights the importance of research into other residual institutional factors which may be sustaining the legacies of past hegemonic masculine attitudes.

While there were a small number of women in our sample, we found significant differences between the way that men and women define masculinity which may provide new potentially fruitful avenues of new research into why many women fail to progress in the construction industry, how any attempts to 'fit in' with the majority of men who work in the industry may be perceived by men and how the gendered institutions (both formal and informal) of construction organisations makes masculine behaviour possible and acceptable for men but not for women and determines women's interpretations and experiences of these behaviours.

Finally, it was surprising that we found little variation in perception of masculinity between trades within the industry, between age groups and between management and operative positions, although our research does suggest that the role of ethnicity, socialisation, age and time spent in the industry would be fruitful avenues of future investigation.

Overall the results contribute a more nuanced understanding into the dimensions and exact nature of masculinity in the construction industry. In particular, the results question the underlying assumption in much construction literature that the industry is highly masculinised at both an absolute and relative level when compared to the wider population, based largely on the considerable evidence that has been accumulated around the dominance of males at all level of the industry and the undeniable difficulties and barriers that women face.

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