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The “last place where we can be men”: understanding women’s marginalisation in the construction industry through a community of practice lens

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Abstract

Purpose – This study examines how social practices within Communities of Practice (CoP) in the Australian construction industry sustain gender biases. It investigates how masculinity is performed and learned on worksites and how these norms shape women’s participation and identity. The purpose is to identify the social practices that reinforce exclusion, assess whether these practices are changing and identify opportunities to accelerate progress toward more gender-inclusive worksites.

Design/methodology/approach – A qualitative methodology was employed, using interviews with men in the Australian construction industry to explore their perceptions of women and gender roles. Findings were considered using a social practice lens to understand how masculinities are learned, performed and reinforced within CoPs.

Findings – The findings reveal that women often adopt masculine traits to gain acceptance, yet full participation in CoP remains elusive for those who do not conform. While gender quotas and training programs have prompted some change, progress is inconsistent. Innovations in work design and evolving attitudes suggest movement toward inclusion, but entrenched biases remain.

Practical implications – The research identifies that efforts to improve gender inclusion in construction must address informal workplace practices. Lasting cultural transformation requires attention to how masculinities and femininities are negotiated within everyday practices. Practical interventions should focus on transforming how masculinities are enacted and valued in daily interactions.

Originality/value – By using a CoP lens, this study offers a different perspective on the maintenance of gender bias and identifies where interventions can be most effective in shifting workplace norms and supporting women in construction.

Keywords Women, Gender bias, Construction industry, Community of practice, Social practice theory

Paper type Research article

1. Introduction

In Australia, the construction industry remains the most male-dominated sector, with the lowest female participation (Workplace Gender Equality Agency, 2024). It is traditionally associated with gendered roles emphasising physical strength, endurance and athleticism (Baron, 2006; Çınar, 2020; Sandberg *et al*., 2016). Traits such as toughness, risk-taking and bravado are often linked to construction work, reinforcing its masculine image (Ankrah *et al*., 2009; Chan, 2011). Research indicates that this perception devalues feminine traits, fostering an environment that marginalises and excludes women (Dainty *et al*., 2000; Galea and

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Chappell, 2022; Galea *et al*., 2023; Holdsworth *et al*., 2023; Stergiou-Kita *et al*., 2015). This entrenched culture sustains gender imbalances and creates barriers that limit women's access to construction jobs (George and Loosemore, 2019).

Women who work in the industry face challenges such as adapting to male-dominated workplace norms, balancing caregiving duties and dealing with discrimination and harassment. Career entry and progression are hindered by restricted professional networks and employer biases questioning their skills and physical abilities. Systemic barriers, including inadequate training and limited access to higher-level roles, further reinforce gender disparities. As a result, women experience higher work-life conflict, stress, burnout and mental health struggles (Deery *et al*., 2011; Galea, 2018), impeding their advancement into leadership positions (Holdsworth *et al*., 2020).

While industry and governments are undertaking initiatives such as setting gender employment targets (State Government of Victoria, 2022; Wright and Conley, 2018) and improving pathways and workplace conditions to support and retain women (Department of Employment and Workplace Relations, 2025), systemic barriers remain. Explicit and implicit gender biases continue to operate within the industry despite the best efforts of many stakeholders to shift the masculine norms. These norms result in women employed onsite not gaining acceptance, and their work not aligning with their training and skills, and as such, "the number of women employed in construction should not be used as a success measure for diversity, equality, and equity" (Holdsworth *et al*., 2020).

While the use of top-down policies and external educational and regulatory interventions is important, social practice theory (Wenger, 1998) suggests that such initiatives may only go part way to addressing explicit and implicit gender biases embedded in work practices in industries such as construction. External interventions can influence social practices; however, such interventions will always be "mediated by the community's production of its practice" (Wenger, 1998). Galea *et al*. (2015, 2020) argue that failure of formal gender equality policies is common in the construction industry due to the informal rules and narratives that work against the achievement of the policy goals. This failure is built from the view put forward by Chappell (2016), that "gender operates as a set of norms and practices on and under the surface of institutions, in ways that profoundly shape their design, paths, and outcomes. It works through formal but especially informal rules and practices".

This research aims to build on these understandings by drawing on the concept of Communities of Practice (CoP) derived from the theory of social practice. Existing literature using CoP theory to understand social practices in the construction industry has predominantly focused on the use of CoPs to share knowledge within organisations and between industry stakeholders (Hizar MdKhuzaimah and Hassan, 2012; Love, 2009; Schenkel and Teigland, 2008; Zhang *et al*., 2022). In the context of women in construction, the development of CoPs prompts the establishment of networks of women working in construction to share experiences, support and resources (State Government of Victoria, 2024).

CoP theory, however, has broader applications beyond knowledge sharing and support networks. CoP theory also provides a valuable lens to understand how existing culture and associated practices are learned and perpetuated within working communities. In this paper, we explore the culture of masculinity in the construction industry. This latter application has received little attention in research. Changing gender biases requires a transformation of how men (and women) think about and value the work performed by women on construction sites and the understandings they hold about what competency means in the varieties of construction work occupations and practices. From a CoPs approach, such transformation primarily occurs through social practices within CoP in workplaces. This lens can help us better understand how such formal and informal gendered rules are formed and sustained in the construction industry and identify opportunities for change in these practices.

In this context and drawing on qualitative research undertaken with men in the Australian construction industry about their experiences and attitudes towards women working in construction, this paper asks the following questions:

(1) How do existing social practices marginalise women in the construction industry and are these changing?

(2) What are the opportunities to accelerate change in these practices to create more gender-inclusive construction worksites?

This paper demonstrates that social practices within the Australian construction industry are deeply influenced by gendered norms, with a particular form of masculinity historically dominating the social practices on construction sites. This dominance shapes both construction work identities and the standards for what is considered competent practice. The research provides a unique perspective on an industry in transition, highlighting how historical social practices are being reshaped by external policy and training interventions and broader cultural shifts influencing local practices. Through a social practice lens, the paper offers suggestions to support and sustain this transition, fostering a more inclusive and evolving industry culture.

2. Communities of practice

CoPs were first conceptualised by Lave and Wenger (1991) and later expanded by Wenger (1998) to explain how learning, identity and meaning emerge from participation in shared social practices. CoP theory shifts attention away from formal education and organisational structures and emphasises how people collectively negotiate the meaning of work, develop shared norms and refine practices through ongoing engagement in everyday activity.

Wenger's conceptualisation of CoPs draws heavily on Bourdieu's theory of social practice (Bourdieu, 1977) in which practices are not neutral routines but socially and historically produced behaviours shaped by relations of power and embodied dispositions. In this view, individuals internalise ways of acting and perceiving the world – habitus – through participation in specific social contexts. These dispositions structure behaviour, but they also evolve as people interact with new contexts and pursue different goals. Bourdieu (1977) emphasises that shared practices form the basis of collective learning and meaning-making. Participation, therefore, involves ongoing engagement within a social context, through which members make sense of their work, develop shared repertoires of tools and routines and build relationships that sustain collaboration. Meaning, in this view, is not an individual attribute but a negotiated achievement embedded in social practice (Wenger, 1998). Through participation in CoPs, individuals learn repertoires of practice and meaning that enable them to become part of a CoP.

In construction, this theory is valuable for exploring how behaviours, assumptions and expectations can become embedded in site cultures, even if they conflict with organisational policies or industry reforms. Wenger (1998) suggests that constellations of practices emerge within larger organisations or contexts where multiple interconnected or overlapping CoPs coexist. In the construction industry, CoP theory suggests that communities form around specific tasks and therefore a construction project is likely to be made up of a large number of CoPs formed around different tasks and associated stages of construction and roles within a project.

2.1 Identity, membership and competence

A central contribution of CoP theory is its explanation of identity as a "trajectory" of participation and learning how to participate within a CoP. Individuals move between different identities according to their experience, engagement and recognition within the community (Wenger, 1998). Wenger identifies a number of different trajectories including:

(1) Inbound: Moving toward full participation.

(2) Insider: Being an established, active member.

(3) Peripheral: Observing without full engagement.

(4) Boundary: Operating at the edges, linking different communities.

(5) Outbound: Transitioning out of the community.

These trajectories shape how workers understand themselves and how others evaluate them as *legitimate* or *competent* participants within the CoP.

Identity, in this framework, is not fixed but constantly negotiated. Participation provides the experiences through which individuals learn and understand who they are in relation to the community. At the same time, the community reinforces particular interpretations of identity through what it chooses to value, reward and recognise. These practices become "markers" of "who belongs" and what it means to be a fully competent member. A marker is a symbolic feature, for example, a behaviour, physical trait, style of communication or way of performing a practice that signals who a person is within a social context (Wenger, 1998).

Competence in a CoP is therefore defined internally within a CoP rather than by external criteria. It includes not only technical skills but also tacit norms about communication, behaviour, physical capability and emotional expression. These expectations become embedded in the community's repertoire that includes shared tools, routines, ways of speaking and informal rules. Learning occurs through engagement rather than formal education, shaping practices and knowledge. Wenger describes learning within a CoP as moving from peripheral participation to full membership, akin to an apprenticeship, which influences identity and perceptions of competence (Wenger, 1998). Therefore, CoP theory suggests that, in construction, identifying as a full (legitimate) member of the community requires newcomers to move from being outsiders at the boundaries to insiders, fully competent in the practices and viewed as legitimate participants by other members of the community.

Practices within a CoP can shift over time through what Wenger (1998) terms "social reconfiguration". This ongoing renegotiation of meanings and identities happens regardless of whether it is intentional. As Wenger (1998) states, CoPs "are already involved in the design of their own learning because ultimately they will decide what they need to learn, what it takes to be a full participant, and how newcomers should be introduced into the community" (Wenger, 1998).

Because CoPs emerge organically through social practice, learning cannot be engineered directly, but the conditions that make learning possible can be shaped. Wenger (1998) argues that practice can be *influenced* by changing the social and structural conditions or "infrastructures", which support learning and change within a CoP. Wenger (1998) refers to these social and structural conditions as "learning architectures". Drawing on Wenger's (1998) work, there are several opportunities to shape such learning architectures including increasing opportunities for meaningful participation (ensuring members have opportunities to engage in legitimate practice), interactions across CoP boundaries (exposure to different perspectives and norms), access to shared tools and practices (the routines, language and resources that embody competence), support for identity negotiation (spaces to develop and reshape one's role within the community) and designed spaces that enable learning (formal or informal structures that make new practices possible).

2.2 CoP dynamics

While the term community might imply harmonious collective coexistence, CoPs can also be characterised by social practices that include disagreement, competition and conflict. It is the enterprise or activity that a group of people are undertaking that creates the CoP. Importantly, the social practices enable the enterprise or activity to be undertaken by the group of people involved. Enterprises reflect complex practices and therefore construction workers are not just robotically performing their required task; they are also engaged in many activities as part of that which is shared with others in that community such as negotiating the completion of tasks,

earning a wage, learning new skills, making work tolerable and even enjoyable (Wenger, 1998).

A CoP can be both a strength and a limitation. The ability to develop practices internally can lead to innovation and success but also to repeated mistakes or stagnant ideas. While they can nurture personal growth and identity, they might also restrict individuality or freedom. Ultimately, CoPs are not inherently good or bad, as it depends on how they function and are used (Wenger, 1998). This then raises the question of how to change undesirable social practices within a CoP, such as toxic masculinity and the exclusion of women on construction worksites.

2.3 Gendered dynamics of participation

While Wenger (1998) mentions gender only briefly, Paechter (2003a, b) significantly extends CoP theory by demonstrating that gender is not a fixed attribute but a set of practices learned and performed within social groups. From early childhood, individuals become members of gendered CoPs – communities of boys or girls – that teach expectations about behaviour, emotion and social roles. These early CoPs shape boys' and girls' interpretations of what constitutes legitimate gender performance. These gendered CoPs shift over time from juvenile notions of gender to adult notions of gender. For example, over time young boys learn adult "masculine" behaviour as part of their transition from peripheral to full membership into adult male CoPs (Paechter, 2003b). Such traits, while diverse and context-dependent, gain coherence within localised masculine communities and are reinforced through daily practice. Individuals navigate multiple CoPs across their lives, including family, school, sport and work, which create a nexus of overlapping identities (Wenger, 1998). This multi-membership can reinforce hegemonic masculinities but can also create possibilities for change (Paechter, 2003a, b), particularly as family relationships or non-work experiences challenge occupational norms.

According to Wenger (1998), gender can influence the trajectory of participation in CoPs. Wenger (1998) uses the example of women seeking equal opportunity who are pushed back into "identities of non-participation", remaining at the margins of a male CoP, excluded from the opportunities of an inward trajectory based on gender-based identity markers. Reification, which is the process of making certain ideas, beliefs or practices appear natural, normal or inevitable, plays a crucial role in how CoPs maintain continuity (Wenger, 1998). Reification can stabilise valuable knowledge but also preserve problematic traditions, such as gendered assumptions about physical capability or emotional toughness. CoPs can make such abstract, socially constructed ideas into fixed markers that give the impression they exist naturally and externally rather than as a product of social practice.

Paechter argues that bodies and bodily forms act as reified markers of gender (Paechter, 2003b). Clothing, physical appearance and also participation in activities such as sports act as gender markers and function as signals of belonging (Paechter, 2003b). Those who do not embody the expected markers may be treated as peripheral or marginal participants of the CoP. This dynamic is highly relevant to construction sites.

2.4 Applications of CoP theory in construction contexts

Within organisations, constellations of CoPs exist based on geographic locations, responsibilities onsite, positions in the construction supply chain or affiliations with trade unions and associations, for example. In the construction industry, these constellations are not within one organisation but "can span institutional structures and hierarchies" (Ruikar *et al*., 2009) with multiple contractors working across different stages of a project and each of these contractors working across multiple projects. According to Ruikar *et al*. (2009, p. 436), in the construction industry, "CoPs exist in most organisations and quite often they remain unrecognised, ignored, or even taken for granted".

Within the construction industry, many researchers have applied CoP theory both to understand existing social practices within organisations and projects and to design interventions aimed at improving organisational or project outcomes. Much of the research focuses on the design of CoPs for knowledge management or studying the relationship between CoPs and knowledge management for different purposes (Hizar Md Khuzaimah and Hassan, 2012; Love, 2009; Schenkel and Teigland, 2008; Zhang *et al*., 2022). Across this literature, two main understandings of CoPs are present, resting on different assumptions about how CoPs come into being. The first view of CoPs is as interventions that can be intentionally cultivated and managed to achieve specific purposes. This "interventionist" view generally assumes that CoPs only exist when they are deliberately designed. This approach tends to focus on "managerial intentions rather than actual practices" (Bishop *et al*., 2008). The second view understands CoPs as existing, emergent social phenomena (Chanal and Kimble, 2010). This "emergent" view assumes that CoPs are always present and arise organically through everyday social practices and can be observed and understood. Research can oscillate between these understandings, with some scholars attempting to combine them. According to Chanal and Kimble (2010), the wider knowledge-management field has shifted from viewing CoPs as naturally emerging communities to portraying them as structured, intentionally cultivated groups.

In construction industry research, interventionist understandings focus on developing or evaluating structured CoPs facilitated through digital platforms, standardised procedures or coordinated roles (for example, see Anbar *et al*., 2024; Bishop *et al*., 2008; Hizar MdKhuzaimah and Hassan, 2012; Love, 2009; Styhre and Gluch, 2010; Wanberg *et al*., 2015; Wanberg *et al*., 2017). Although these interventions aim to improve knowledge flow, studies highlight challenges in applying them within a fragmented, project-based industry where teams are temporary and turnover is high (Remington and Ragsdell, 2006). The construction industry's project-based structure, characterised by short project cycles, subcontracting, adversarial contracts and reconstituted teams, limits the stability needed for CoPs to develop. Fragmentation reduces "absorptive capacity" (Bresnen *et al*., 2005) and constrains the diffusion of new knowledge. Elmualim and Govender (2008) note that within the construction industry CoPs, there is also a risk of groupthink, where particular ideas and practices become reinforced without critical reflection. Furthermore, low levels of trust between different construction industry CoPs can hinder knowledge sharing and principal contractors often have limited ability to influence CoPs across the various subcontractors engaged on a project (Elmualim and Govender, 2008).

Emergent understandings used in construction industry research examine naturally occurring CoPs embedded in the everyday routines of project teams, engineering groups and site-based interactions (see, for example, Bresnen *et al*., 2005; Liu *et al*., 2022; Oswald *et al*., 2019; Ruikar *et al*., 2009; Schenkel and Teigland, 2008; Yu *et al*., 2013; Zhang *et al*., 2022). These studies show that informal interactions and shared experience, not simply formal structures, are central to how knowledge within construction projects is exchanged. From this perspective, CoPs can be influenced, but primarily through attention to the interpersonal and social dimensions of work rather than technological or procedural mechanisms (Bresnen *et al*., 2005). In Wenger's (1998) terms, CoPs can be influenced through shaping "learning architectures", which are not step-by-step instructions or formal training programs, but rather designed elements of a social environment that make certain kinds of learning possible.

2.5 Using CoP to explore women's marginalisation in the construction industry

Within this theoretical and research context, this paper draws on key concepts from CoP theory (Lave and Wenger, 1991; Paechter, 2003b; Wenger, 1998) to analyse men's perceptions of women working in the construction industry. CoP theory provides a lens for exploring how gendered norms are embedded within everyday practices and how these shape women's

participation. Three concepts are used to analyse how existing social practices marginalise women:

(1) Reification of masculine meanings – how masculine traits and behaviours become normalised and continually reproduced through everyday practices, shaping what is valued within the construction industry CoPs.

(2) Gendered markers of competence and identity – how assumptions about femininity and masculinity shape who is recognised as a legitimate participant.

(3) Processes of inclusion and exclusion – how shared practices and identities reinforce boundaries that position men as default insiders and women as peripheral members and constrains women's inward trajectories.

CoP theory is also used to examine whether these gendered practices are shifting over time and to identify opportunities to influence the learning architectures (Wenger, 1998) of construction industry CoPs, including the social and structural conditions that enable changes in participation, identity and practice.

3. Method

Given the social practices associated with gender as identified in the literature (Paechter, 2003a, b; Wenger, 1998), this study employed a qualitative research methodology to gain a deeper understanding of these practices. This paper reports on findings from a broader study that sought to understand men's perspectives of women working in construction. The study used a qualitative research method that aimed to help fill a research gap in empirical evidence regarding masculinity in the construction industry (George and Loosemore, 2019) and men's views on the reasons for gender-based inequality in organisations and their attitudes toward gender equality in the workplace (Bergman *et al*., 2014). A qualitative approach was appropriate for this study because it enables an interpretive understanding of people's experiences, allowing researchers to explore how individuals make sense of their world and construct meaning from their perspectives (Snape and Spencer, 2003). The study involved a survey and follow-up interviews with men working in trade and labour roles on commercial, civil and residential construction projects in Australia. This paper presents an analysis of qualitative interview data from this study using CoP theory. The study received ethics approval from the [Self-identifying reference removed for peer review] Human Research Ethics Committee (Approval No. 2025-27209-30217). All participants provided written or verbal consent.

Semi-structured interviews were chosen because of their suitability for understanding the lived experience of interviewees and exploring new phenomena as they arise during the interviews (Galletta and Cross, 2013), allowing for flexibility and for the participant to frame their own experiences (Bryman, 2004), capturing multiple, unique perspectives (Cohen *et al*., 2011; Fontana and Frey, 2005).

3.1 Sampling and participants

Data collection took place between February and June 2024. Participants were recruited with the assistance of an industry-based construction association. A total of 64 men were interviewed by members of the research team either in-person or by phone. These participants were drawn from a much larger dataset ($n = 735$) gathered through the parallel survey of construction workers. The number of interviews was deemed sufficient because data saturation had been reached. While there is no single agreed-upon method for determining saturation (Fusch and Ness, 2015), analysis of the 64 interviews indicated that no new themes were emerging. This provides reasonable evidence that thematic saturation was achieved (Fusch and Ness, 2015). In addition, consistent with the aims of qualitative research, the dataset was sufficiently rich to illuminate what social phenomena exist within the context

studied rather than how many instances occur (Crouch and McKenzie, 2006). Together, these considerations justify the adequacy of the sample size.

3.2 Interview schedule and question design

The 26-question interview schedule was informed by a literature review and empirical findings from previous research undertaken by the authors with women and other key stakeholders working in construction in Australia, which identified gendered biases, barriers to participation, cultural dynamics and workplace exclusion (Self-identifying references removed). Interview questions fell into three categories:

(1) Demographic and professional background: age, experience and role.

(2) Attitudes toward women in construction: perceptions of women's belonging, capability, suitability for roles, perceived challenges and comparisons with men.

(3) Workplace culture and responsibility for change: experiences working with women, observed behaviours and attitudes, responses to gender issues and views on who should drive change.

This structure enabled reflection at both personal and cultural levels, supporting interpretation of social norms and practices.

3.3 Data analysis

Each interview lasted between 45 and 90 minutes, was audio-recorded, professionally transcribed and checked against the recordings for accuracy before being coded and inductively analysed in NVivo 12. Given the qualitative nature of the study, this approach was deemed suitable for data analysis (Boyatzis, 1998). Following the procedures recommended by Braun and Clarke (2006) and Nowell *et al*. (2017), the research team undertook an iterative analysis process that involved (1) data familiarisation, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes and (6) reporting findings. Throughout this process, the team engaged in reflective discussions to refine and verify coding decisions until consensus was reached (Terry *et al*., 2017). To assess the prominence of themes, theme coding was also quantified using a general content analysis framework (Franzosi, 2004).

4. Findings

Participants held various occupations in the construction industry. Participant ages ranged from 18 to 70. The largest group comprised of workers aged 51–60, accounting for 20 individuals. This is followed by the 41–50 age group, with 17 workers, and the 31–40 age group, comprising 14 workers. Younger workers aged 18–30 represent a smaller portion, with 5 individuals, while the 61–70 age group includes 8 workers. Participants had a range of experiences working with women onsite, which fell into the categories shown in Table 1.

Table 1. Participants' experiences working with women onsite

Experience categories	Number
Working directly in my work crew	31
Working onsite in management, trade and labour roles outside of my direct crew	27
Working onsite in other unspecified roles outside of my direct crew	2
Working onsite in administration roles	4
Total	*64*

Source(s): Authors' own work

Participants held a range of occupations in the industry, with 31 working in formal union delegate positions at the time of the interviews and previous experience in construction trade and labour roles. The remaining 33 participants were working in occupations that included carpenters and joiners ($n = 18$) dogmen/riggers ($n = 8$), labourers or general construction workers ($n = 5$), traffic controllers ($n = 5$), machine operators ($n = 3$) and plasterers ($n = 3$), formworkers ($n = 2$), glaziers ($n = 2$), steel fixers ($n = 2$) and trade assistants ($n = 2$). Most participants worked primarily in suburban or metropolitan areas (75%), with a smaller number working across both metropolitan and regional sites (22%) and a small minority based exclusively in regional Queensland (3%). The majority were employed in the commercial construction sector (70%), with fewer working in civil construction (17%) and a small proportion in the domestic sector (6%), while the remainder worked across multiple subsectors. Participants brought substantial industry experience, with 83% having worked in construction for more than 11 years and over half (56%) having more than 20 years' experience.

4.1 Gender biases in construction practices

The data presented in this section sheds light on how gender roles and norms are both enacted and maintained within CoPs in the construction industry. From the data collected in this study, this occurs in three main ways: first, by treating the concept of a "man's world" as if it were a real, fixed state that exists naturally; second, by defining competency within the community based on traits associated with masculinity; and third, by rejecting feminine identity markers, such as appearance and behaviour.

4.1.1 Construction industry as "a man's world". The interview data highlights a view of the construction industry as a "man's world", which, based on the data, has the effect of excluding women in social practices on site and in recruitment. Participants noted that many companies and individuals view construction as a male-centric domain: "*If you think of construction, you think it's a man's industry"* (P7). P2 observed, *"Unfortunately, the blokes up higher [in management] just don't seem to want to give women the opportunities"* and P37 commented that "*a lot of bosses will go just put a young fit bloke on than give it [the work] to a girl*".

Participants also noted societal stereotypes deterring women from entering the industry. P22 explained, "There's very much an old school way of thinking that girls should be teachers and nurses; that's why I think there's not many women [in construction]". This stereotype is ingrained through traditions and family legacies, as suggested by P4, who mentioned that "most men just follow their fathers, grandfathers".

A significant proportion of participants (31%) perceived the male-dominated and sometimes hostile construction culture as a barrier to female participation. P5 described the industry as historically *"uninviting*", while P16 highlighted the intimidation faced by women due to onsite behaviours and frequent vulgar language. P6 described the characteristics of their colleagues as *"a bunch of smelly, dirty, obscene mouthed blokes"*. P22 noted the daunting nature of entering an environment heavily "*dominated by men*".

Participants observed that men who continue to behave in a way that excludes and degrades women do not want the industry to change. If the industry does change, these men "*can't say what they want to say*" (P48). Similarly, another participant reflected on his experience of men's resistance to an inclusive and respectful culture:

> I sit in a crib room with 20 blokes. Today, we would talk differently until a lady walked in, and then you just turn your conversation down and talk sport and to the facts normal like you talk at home. And that still happens today. Do I resent? No, but do other blokes do? 100 percent they do [because] it's our group s**t, it's our time, it's our half an hour (P39).

Despite some support for women's inclusion, a "boys' club" culture persists, with P35 voicing the sentiment of some older workers: *"They're the ones that have always known that way of working – it's always been a man's world, and it should stay that way*".

The interview data indicate that the social production of the construction of the "man's world" reinforces inequality in everyday social practices. In treating the idea that the industry "belongs" to men as natural or self-evident, rather than as a socially produced belief, participants enact a form of reification. The belief that construction is a "man's world" becomes taken for granted, creating boundaries. According to CoP theory, this then has the effect of positioning men as the default or legitimate participants. Women, and those who display traits coded as feminine, are consequently rendered peripheral, excluded or marginalised. This belief creates boundaries within the CoP, shaping it as a space where men are seen as the default participants, while women or individuals displaying feminine traits are often excluded or marginalised. This is evidenced by comments that suggest that women must adapt to existing masculine norms to succeed in the industry. P9 suggested that women must navigate the industry by *"being one of the boys"*. Many participants believed that women could have a successful long-term career in construction if they could fit into the masculine work culture prevalent in construction, that women needed to *"conform to what the industry is after"* (P19).

Interestingly, some participants reflected on the challenges of interacting with women when the existing social practices are challenged by the presence of women. A number of participants described uncertainty among some male coworkers about what behaviours were appropriate when women joined their worksites. The response was still to exclude women from social interactions in the absence of inclusive social practices. For example, one man reflected on his conversations with male colleagues:

> Men on-site will say, "I'm afraid to talk to them [women on-site] because I might say the wrong thing" . . . Then it's like, "What, so you just ignore them and pretend they don't exist?" [P47]

4.1.2 Gendered competencies: "They just can't do our job mate". The data highlights varied perspectives on women's competencies in the construction industry; however, responses indicate perceptions that women are less able to contribute to construction. Some participants doubted women's suitability for physically demanding roles. P34 stated, *"You see some [women], they actually do struggle . . . the physical thing's definitely an aspect"*. Similarly, P40 said, *"There's a few [roles] that are really labour intensive . . . less women could do them than men"*. This reflects a belief that physical strength gives men an advantage: *"Chances are the guy's going to end up better off at that job than a woman"* (P10).

There is also a sense of resentment when men are expected to perform tasks women struggle with due to strength limitations. P49 noted, *"[when men] have to pick up a bit of the slack if women couldn't handle it"*. Some younger workers voiced resistance, saying, *"They just can't do our job mate . . . they can't lift the sheet of ply"* (P39).

There is a perception amongst men in the industry that women are less capable. P50 commented, *"A bloke thinks they can do their job better than a woman"*. P62 echoed that there is a view from men that, *"You can't lift that because you're a girl"*. Men interviewed noted that women need to prove themselves more than men, as P47 advised, *"Work harder than the guys . . . set the standard"*. Participants' accounts suggested that the "repertoire" of communication practices and methods of performing work, and as such what is considered competence, is founded on masculine norms. Women have to prove themselves by being more physical and working harder than men. As we will see in the following section on gender markers, feminine traits and perspectives are also excluded from what is recognised as competence.

Despite these existing practices, there are indications that attributes traditionally associated with women are increasingly appreciated in these work practices. Women are recognised for their attention to detail and safety. *"[Women are] a bit more precise . . . do the right thing and make sure they do a good job"* (P21). Women are seen as enhancing workplace culture by softening its traditionally masculine tone. P4 observed, *"[Women] settle the guys down . . . stops the big macho fest"*. P19 added, *"[Women] make it more pleasant all around"*.

The presence of women positively influences men's behaviour, fostering professionalism and respect. P36 noted, *"It makes males do the right thing . . . say nice things"*. P42 highlighted, *"When you've got women in the room . . . more open conversation can take place"*. However, this positivity towards traditionally feminine traits is also a double-edged sword if certain roles are understood as being suitable for women while others are not because of feminine identity markers.

Importantly for supporting change, participants who had worked with women held an inclusive perspective on women's capabilities regardless of gender. Many participants believe women can perform any role if they have the necessary skills. P10 remarked, *"You need all shapes and sizes in your team . . . tasks that people are better suited to . . . perfect roles for women"*. P47 added, "*If you're working with a good solid worker, you just embrace it*".

4.1.3 Gender markers: "Too much of a distraction to the boys". The data demonstrates that a significant gender marker, a feminine appearance, is often perceived as incompatible with the workplace, irrespective of a woman's abilities and skills. Participants noted that some women wore "inappropriate" clothing to work, which distracted the male workers. One participant provided an example of when a woman had worn sporting attire to the worksite and the impact this had on the males, "*they should be wearing work wear, otherwise they're too much of a distraction to the boys*" (P1). P1 believed that when women wore tight-fitting clothing, it could potentially lead to sexual harassment: *"[bringing] sexuality onto a worksite giving the guys the wrong image, which is going to lead to possible sexual harassment"*. P1 went on to explain that such behaviour from women resulted in women *"advertising the wrong product"* and undermining the presence of women in the workplace. In each of these examples, the focus is not on wearing workwear for physical protection from construction hazards but on the female markers and the sexual distraction this creates for men.

Some participants reported situations where women were judged primarily on their appearance. In some cases, the "pretty" women may be judged as less capable. For example, one participant had initially judged a woman based on her appearance and was surprised when his judgment was incorrect:

> This girl, honestly, ... She's quite scary . . . the men know not to mess with her . . . she went toe to toe with one of the guys. And the worst thing is, she was quite pretty until she opened her mouth . . . she was literally one of the boys. She could drink as hard as they could. She could work as hard as they could. (P41).

This statement reflects an instance where physical appearance is used to identify construction workers as part of or not part of the CoP. In this case, the woman was able to override her "pretty" appearance, a marker that she was not an insider within the CoP, with masculine behaviour and was therefore accepted and given credibility.

Some participants identified that on some occasions, women received different treatment and followed different rules not in line with common practices within construction industry CoPs, solely because of their appearance. For example:

> I want the boss to have the stones to call out a female when she's not doing her job properly. And when they don't do that, the other guys literally go . . .. "I guess you just need to have botox in your lips and big t**s and you don't need to bother working around here". And then it causes a lot of resentment with the males who are doing the same job, and they're going to have to pick up the slack on the worker who isn't working. As I say, a male would have been chucked out on his backside . . . the ones [women] that I find the hardest working, they don't turn up with the make-up . . . they don't put too much time into their appearance because they do what the other guys do, roll out of bed at 4.30 in the morning, go to work and get it done . . . (P47)

Several participants described instances where expressions of femininity were disapproved of or viewed as incompatible with their site's norms. Gender markers, including physical traits like hair and clothing, play a crucial role in shaping perceptions within gendered spaces (Paechter, 2003a, b).

4.2 Shifting social practices

The data not only highlights the existing social practices within communities of practice perpetuating gender biases in the construction industry but also how these are changing in the context of training initiatives, formal employment policies, societal change and membership of specific construction communities such as unions or associations. This section highlights how the norms and practices within construction industry CoPs are slowly shifting to include women as part of construction and the external and internal processes that are influencing and responding to these changes.

4.2.1 Gender equity training programs: "everybody's got to do a course". One approach taken by several organisations and industry bodies to foster greater gender inclusivity in the industry is through training programs. The individuals interviewed reported having recently participated in gender equity training provided by an industry association as part of a work requirement: "*Everybody's got to do a course*" [P51]. The interview data illustrated the dual dynamics of rejection and integration of gender training within the participants' CoP.

Many participants noted that the gender training received significant resistance, particularly concerning the change that the training represented. For example, P51 noted that there was "*kickback*" to the training, partly due to "*preconceived ideas*". Another participant stated *that "there's a fair bit of resentment out there . . . people don't like change and as soon as there's any change people blow up . . . "* [P51]. This indicates resistance to changes suggested by the training that disrupt established norms.

Several comments suggest a generational element to the resistance, aligning with Wenger's (1998) idea that historical norms and established identities influence acceptance. P44 noted that in their experience with workers rejecting the training, *"all those examples are people over the age of 40"*, indicating a possible generational divide within the CoP, where older members may find it harder to integrate new practices that challenge long-standing beliefs.

The interview data also indicated that the training seemed misaligned with what the participants find valuable and that too much gender training is being rejected: *"Too much training frustrates people . . . 'We've done this. This is similar to the other one . . . "* [P49]. Another participant reflected that training is limited because *"You can't tell someone to be a good person"* [P53].

On the other hand, the data indicates that the training was broadening the perspectives of some participants. P48 and P46 described a shift in perspective, suggesting initial resistance may be overcome through empathy and understanding the training's relevance. *"After doing gender equity training, it broadens your mind . . . it just doesn't cross your mind that that may be offending a female . . . "* [P48]. And, *"That course opened up my eyes. I do look at things different now . . . "* [P46].

The data suggests that while the gender equity training met with resistance, which could be a result of a misalignment with existing CoP norms and generational beliefs, it also facilitated positive change for some individuals who were able to integrate the new knowledge through personal reflection and empathy. This dual reaction underscores the importance of external programs and also the need for designs that consider the CoPs in which they are aiming to educate.

4.2.2 Formal employment policies: the "only way it's going to happen". One initiative aimed at increasing the number of women in construction is the implementation of gender targets or quotas. This approach has interesting effects on CoPs, as the data show a range of opinions on these targets. Some individuals support the inclusion of women in the industry through targets, while others argue that external policies designed to promote women's participation in construction are not beneficial. They believe that women entering the field because of such policies may not possess the necessary skills and practices to participate fully within the construction industry CoPs.

Almost half of the participants did not support targets because they were concerned that women without the required skills and capabilities would be employed: "*The best person should always get the job first. Not just because of sex or whatever. That's not being equal*".

Employing women in roles that they are not qualified for or able to undertake successfully can lead to harassment from men: *"It causes all sorts of issues of bullying, harassment, and other things that go on"* (P12).

P18 noted that many women he has witnessed entering the industry do so due to quotas, and *"because they can't get X amount of women, they've got to find jobs for the ones who don't want to do hard yards"*. By hard yards, this participant believed that accessing employment in construction was attained by men working their way up the ranks by doing *"the dirty jobs"* and proving their capability and physicality. In contrast, quotas for women result in:

> People [women] in positions potentially that aren't doing those hard yards and earning that position based on their skills also demonstrating their commitment and motivation to be in the industry.

Men interviewed felt that women employed to meet a gender quota can be placed in a difficult position, requiring them to be *"exceptionally good women. Because that's what it's going to require breaking into the industry to change that issue"* (P22). Similarly, P26 commented:

> As soon as that label gets attached to you, it is very difficult to shake. That's what I mean about women having to prove themselves on-site just to make sure everyone knows, "No, I didn't get hired because I'm a woman. I got hired because I'm good at this."

Participants who supported quotas to increase women's representation were also concerned about employing the right people. P12 commented, *"I've got no problem with that so long as they're just employing the people who are capable and fit to do that job"*.

Another participant cautioned that they *"don't think putting women into a problem is a way to get an answer . . . I think you need to fix it for the people that are in there before you think about putting more there"* (P34). This suggests that the community must change to accept women before they are placed in it. The participant responses indicate that the primary requirement is to fit in with existing onsite practices, and gender targets may lead to the "wrong" people being hired who do not meet the competency requirements for legitimate participation. However, as noted previously, participants who had worked with women were more accepting of women as equal contributors to the worksite.

P13 was aware that gender quotas are being used on construction projects in other regions in Australia and viewed them as a positive initiative: *"I think that's the biggest step forward you can do with procurement. That's definitely a big step forward"* to increase women's representation in construction. Half of the participants interviewed were, in fact, supportive of gender targets. For example: "*I'm not a big fan of quotas, but that's the only way it's going to happen*" (P51). Another participant stated that targets are important for change: "*If we are going to build something and as taxpayers' money; we should train people, we should bring different genders in . . . And that's the way I see it change*" (P39).

4.2.3 Changing work tools and practices. Work design also supports changes in social practices in work where physicality has become less important for achieving the task. Participants described machinery and lifting aids as some of the ways that tasks had been redesigned to cater for women's physical capacity. For example,

> The whole industry has been designed – more recently, to accommodate women. The limits are that if we need to lift it on 10 kilos, we need to use some mechanical aid and stuff like that and that's all been brought in just specifically for women in the industry (P19).

One participant noted that while the physical aspect of some roles could be challenging for women, occupational health and safety laws have influenced the way that work has been redesigned, and this *"has helped a lot of women achieve an equal footing with a lot of men*" (P55).

4.2.4 Multi-memberships: "I've got women around me, my mum, my sister, my daughter, my partner". The interview data reveal how some men leverage their identities from different CoPs in their personal lives to shape their behaviour in construction settings. While some use

their home life CoPs to highlight what they appreciate about the male-dominated work environment, others navigate multiple community memberships in various contexts.

One participant reflected on how their behaviour onsite is influenced by women in their home and family life, which helps them treat women onsite with respect: *"I've got women around me, my mum, my sister, my daughter, my partner"* [P36]. Another participant reflected this same sentiment, *"I've pretty much been grown up by women, grandparents, and mum. That's been good for me. As I said, I'm very respectful of women"* [P42]. P44 reflected on how they use behavioural norms from their family upbringing to influence how they speak at work, *"If my mum heard me say that, I'd probably get in trouble. So, I think it's just how you were raised"* [P44]. This indicates that broader societal shifts outside of construction can influence practices within the construction industry CoPs.

Conversely, some participants actively considered the differing behavioural norms that exist between their work and family lives. They argued that the workplace, shaped by masculine norms, provides a space where they can freely express traditional masculinity in contrast to their domestic environments: *"This is our last standing point, this is our last place where we can be men, it's our last freedom . . . I already go home to my wife, I don't need to be doing this on-site"* [P35].

4.2.5 CoPs as a learning community: "Women have the right to work in construction". Despite the views of some of those in the construction industry that continue to influence and define practice and competence that exclude women, all the men who participated in the research believed women belonged in the construction industry. P4 commented, *"Hundred percent, yes. I think it's great that women are in the industry"*. P12 reflected that *"women have the right to work in construction"*. P5 commented:

> I'm a health and safety representative and we are here to defend them [women] . . . provide them a safe space . . . stand up for them, if they're at all scared, worried or have any concerns we are here for them . . . and [will] make sure that they have a good long career.

P30 noted that women "belong wherever they want to belong . . . No one starts with the skills and the capabilities . . . anyone can learn it . . . They're not less capable". Several participants labelled men in the industry who refuse to accept women working onsite as "dinosaurs". This highlights how transformation can occur within CoPs as learning communities that do and can evolve over time in response to external influences on practices.

5. Discussion

5.1 Gendered trajectories and peripheral participation

The findings show that women continue to be positioned as peripheral members within the construction industry CoPs. Existing research exploring women's perspectives identifies that this exclusion significantly impacts women's interest in working in construction roles and also their retention once employed in the industry (Holdsworth *et al*., 2023). The men interviewed, while broadly supporting women working in the industry, expressed much evidence of continued biases and marginalisation of women in construction. These practices prevent women from participating in the informal learning and identity-building processes that enable workers to become recognised members of the community. As Wenger (1998) argues, when individuals' contributions are not recognised or taken up, they begin to develop identities of non-participation. This was evident in men's accounts of situations in which women were ignored, doubted or expected to "prove themselves" more than their male counterparts. Ideally, women should be able to progress along the same inward trajectory as men, gaining experience, contributing to the shaping of shared practices and workplace culture. However, the findings indicate that gendered expectations regarding competence and behaviour constrain women's progression to insider status. As Wenger (1998) notes, belonging is central to exercising influence, and the research suggests that women in the construction industry are often denied the belonging required for them to contribute to the shaping of workplace social practice.

5.2 Reinforcing women's exclusion

The findings indicate that strong gendered (male) identities and meanings are present within the construction industry, emerging organically through everyday social practices, characteristic of an emergent understanding of CoPs. These gendered CoPs persist despite the fragmented, project-based nature of the industry, which is often argued to limit the formation of shared identities and constrain knowledge sharing (Bresnen *et al*., 2005; Elmualim and Govender, 2008; Ruikar *et al*., 2009). Instead, this study shows that shared identities and meanings operate within construction industry CoPs, where they function to regulate gendered participation and sustain established power dynamics. Historically rooted and reified masculine meanings of construction work continue to be taken for granted as the natural basis of competence. Participants described women as needing to work harder than men to gain credibility, and at times, demonstrate toughness beyond what is expected of men. Some male participants reported that women were judged differently by supervisors, which led to resentment among some men. Femininity was frequently perceived as a weakness or as requiring additional support. These challenges echo previous studies (Holdsworth *et al*., 2023).

Everyday social practices including language, humour, behavioural norms and informal rules continually reproduce masculine standards and shape judgments of who is seen as a legitimate participant. When workers rely on taken-for-granted norms to judge who belongs, the community tends to reinforce familiar assumptions rather than question them, mirroring observations that construction teams can slip into groupthink and stereotype-sharing (Elmualim and Govender, 2008). Participants' accounts of needing to "fit in", moderate language and adopt masculine behaviours indicate how these shared ideas pressure newcomers to conform. Over time, these norms can become difficult to shift, as communities often defend established ways of working and resist behaviours that fall outside them, a pattern Schenkel and Teigland (2008) describe as "core rigidities". Some workers actively defend these identity boundaries, keeping women peripheral and reinforcing masculine dominance. This extends beyond physical capability to language and humour, with some men resenting the need to moderate their behaviour around women.

The mobility of workers across multiple sites means that entrenched masculine norms travel with them, allowing gendered practices to be reproduced across projects. While multi-membership has the potential to spread new practices, the findings suggest it currently circulates gendered norms. Informal networks that drive hiring, task allocation, mentoring and promotion remain male-dominated (Holdsworth and Turner, 2022), limiting women's access to opportunities for full participation. Finally, gender itself is a visible marker of identity, making women's difference highly salient and reinforcing their positioning as outsiders within these CoPs.

Taken together, the findings show that women's presence within construction teams alone is not enough for their acceptance as members of CoPs. The findings illustrate how shared identities and definitions of competence can produce exclusionary outcomes even when men express support for women's involvement. The findings also show how CoPs can reproduce implicit biases, as identified by Holdsworth *et al*. (2023), without explicit discriminatory intent.

5.3 Designing conditions for change

The findings, however, indicate that slow but meaningful change is beginning to take root in social practices within the construction industry. This transformation is propelled by broader external forces, including gender quotas, safety laws and mechanised tools, training, changing workforce demographics, prompting some construction industry CoPs to renegotiate their identities, shared practices, behaviours and notions of competence. However, there are greater opportunities to shape the learning architectures (Wenger, 1998) that underpin learning and change within construction industry CoPs. These include fostering meaningful participation

by women, strengthening boundary-crossing interactions across groups, improving access to shared tools and practices, creating opportunities for identity negotiation and designing spaces that support learning for all, regardless of gender.

5.3.1 Increasing opportunities for meaningful participation. This research highlights the need to create more opportunities for women to engage in meaningful participation that places them on a genuine inward CoP trajectory. Current practices often restrict women's participation to peripheral tasks that do not require "masculine traits", thereby reinforcing exclusion. Formal structures such as quotas, policies and compliance frameworks are important, but as participants' accounts demonstrated, they cannot dictate the practices that emerge in response (Wenger, 1998). Entrenched informal norms often continue to govern behaviour (Galea *et al*., 2020), which is why gender initiatives only shift practice when they translate into real participation opportunities embedded in everyday work. Based on CoP theory, initiatives such as structured mentoring, shared tasks and entry-level pathways that provide women with regular access to core site activities can help create conditions that enable women to learn, contribute and be recognised as full participants. Such interventions, however, require leadership from within industry CoPs. A point revisited later.

5.3.2 Boundary encounters and cross-community interactions. Construction projects involve rotating crews, subcontractors, unions and mixed teams (Ruikar *et al*., 2009), creating natural boundary spaces where people encounter different practices and perspectives. The findings show that when men work alongside women – even a single woman – their perceptions begin to shift, with language becoming more respectful, behaviour moderating and gendered assumptions being challenged. This aligns with Ruikar *et al*. (2009), who observe that construction teams function as temporary, fluid CoPs whose transformation depends on how newcomers reshape boundaries, identities and expectations. Given that workers frequently move across sites, inclusive practices introduced on one project can diffuse across the industry through multi-membership and boundary-spanning roles (Bresnen *et al*., 2005). Industry associations and unions can reinforce this diffusion by providing shared spaces where inclusive norms are articulated and normalised. This further highlights the importance of having the key people in positions that can influence CoP practice at the right moments (Wenger, 1998).

5.3.3 Access to shared repertoires. To reshape CoPs, women must have access to the shared repertoire of routines, stories, tools and tacit knowledge that define competence (Wenger, 1998). Yet the findings illustrate women are often excluded from informal conversations and judged through gendered markers of competence, with some men assuming they lack the necessary capability for many construction roles. Participants described mechanised equipment, redesigned tasks and safety-driven changes as helping women gain an equal footing in the industry, illustrating how changes in tools and work design can shift the repertoire of practice. This echoes findings from Agapiou (2002) that altering the physical nature of tasks challenges deeply held assumptions about gender and capability.

5.3.4 Support for identity negotiation. Identity formation is central to learning in CoPs (Wenger, 1998). The findings show that women face significant constraints when negotiating identities as legitimate construction workers, including expectations to fit in by adopting masculine behaviours. Some participants also described resentment when supervisors treated women differently, which reinforced the identities of women as outsiders. These patterns reflect how CoPs maintain established identities and can resist challenges to their shared meanings (Chanal and Kimble, 2010). Supervisors and experienced workers, therefore, again, play a critical role in enabling identity negotiation by modelling inclusive behaviour, challenging implicit and explicit biases and creating space for women to contribute meaningfully to shared practice.

The findings also show that generational dynamics shape identity negotiation. Some participants described older workers who reject women's presence as "dinosaurs", indicating that these views, which inform masculine construction industry identities, are now on an outward trajectory as norms shift. Wenger (1998) refers to these moments of change as

"generational discontinuities", in which newcomers bring different expectations that prompt the renegotiation of behaviours and relationships.

5.3.5 Designed spaces for learning. Training programs are one type of formal learning space, but this research indicates such interventions only influence behaviour when connected with how work is practised onsite. This finding is supported by studies in construction that similarly demonstrate that knowledge sharing and behavioural change rely more on interpersonal trust and shared understanding than on formal structures or technologies (Bresnen *et al*., 2005; Ruikar *et al*., 2009; Schenkel and Teigland, 2008). Many participants described gender-equity training as repetitive, irrelevant or misaligned with onsite realities, which helps explain why formal training programs delivered by those outside the CoP can be "othered" or resisted. This reflects critiques of decontextualised professional development (Webster-Wright, 2009) and supports Wenger's (1998) argument that practice is a response to design, not a product of it. Chanal and Kimble (2010) further warn that when CoPs are over-managed or approached through heavy-handed external interventions, they may retreat, fragment or become less visible. The findings of this study reinforce this point: training imposed from outside the CoP may elicit rejection rather than reflection. For formal training to be effective in construction settings, it must therefore be embedded within the CoP, delivered by credible insiders, aligned with existing repertoires of practice and tied directly to the situations in which workers negotiate meaning, identity and competence.

6. Conclusion

This paper examined how existing social practices within the construction industry CoPs marginalise women and identified opportunities to accelerate change toward a more gender-inclusive industry. In addressing the first research question, the findings show that gendered norms remain embedded in the everyday practices that shape legitimacy, competence and belonging in construction industry CoPs. Women continue to be positioned as peripheral members. Their competence is questioned, masculine markers of belonging constrain their identities and their access to shared repertoires of knowledge is limited. These practices marginalise women not only through overt exclusion but through subtle, routine interactions that normalise masculine behaviours as the standard for legitimate participation. At the same time, slow shifts are emerging. Mechanised work practices, generational turnover and broader cultural changes are beginning to disrupt long-standing assumptions about physical ability and gendered suitability for construction roles, indicating movement toward redefining competence within some CoPs.

Applying a CoP lens deepens understanding of how gendered norms are reproduced and sustained in construction and demonstrates why formal gender-equity policies alone struggle to shift practice. CoP theory reveals exclusion as a social process that is embedded in meaning-making, identity formation and everyday participation. This paper also contributes to CoP scholarship by demonstrating that enduring CoPs can exist within a fragmented, project-based industry traditionally regarded as too unstable for success. These CoPs continue to exist not because of organisational continuity but because gendered identities and practices are continually reproduced across projects, teams and roles.

In addressing the second research question, the findings highlight clear opportunities to accelerate change by shaping the learning architectures that support identity negotiation, participation and shared meaning. Interventions that enable meaningful participation are essential for supporting women's inward trajectories. Boundary encounters, particularly mixed-gender teams and rotating project crews, provide leverage points for challenging assumptions and diffusing inclusive practices across interconnected CoPs. Innovations in tools and work design can help reconstruct the repertoire of shared practice by redirecting competence away from physical dominance towards collaboration, adaptability and technical skill. Unions, industry associations and respected site leaders also play a crucial role in reinforcing inclusive norms across multiple CoPs, while training that aligns with existing

repertoires and is delivered by credible internal members is more likely to become embedded in everyday practice.

While this paper demonstrates the analytical value of CoP theory for understanding women's exclusion in construction, it is important to emphasise that the study is preliminary. The CoP lens was applied retrospectively rather than being embedded in the study's original design. As such, the findings illustrate how CoP theory can illuminate gendered dynamics but do not constitute a comprehensive CoP-grounded investigation. A study deliberately designed around CoP principles would allow for a deeper examination of how boundaries are constructed, negotiated and policed within different construction industry CoPs and how gender operates as a marker of legitimacy, belonging and exclusion across these settings.

Future research that applies CoP theory from the outset could more rigorously investigate the distinct CoPs that characterise the construction industry – across trades, subcontractors, unions, design teams, onsite crews and project phases – and examine how gendered norms, membership criteria and shared meanings vary across these communities. Such work could also analyse the role of boundary spanners, multi-membership and cross-project mobility in either reinforcing or challenging gendered identities. Incorporating women's own perspectives would further deepen understanding of the lived experience of negotiating CoP boundaries and provide insight into the strategies women use to navigate, resist or reshape gendered expectations. This paper lays the groundwork for future research into how gender operates within and across construction industry CoPs and how targeted, CoP-informed interventions might more effectively support gender-inclusive change.

Ethical considerations

The study was approved by the RMIT University Human Research Ethics Committee (Reference Number: 27209) on 24/06/2024. All participants provided written or verbal informed consent before participating.

Data availability statement

Research data are not shared.

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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*, Vol. 20 No. 8, pp. 697-705, doi: 10.1080/0144619021000024989.

Anbar, D.R., Chang, T., Ullah, S., Alqershy, M.T., Mousa, K. and Deng, X. (2024), "The role of interpersonal distrust as a mediator of the relationship between ethnic minorities and knowledge hiding in international construction projects", *Engineering, Construction and Architectural Management*, Vol. 33 No. 1, pp. 832-836, doi: 10.1108/ECAM-04-2024-0486.

Ankrah, N., Proverbs, D. and Debrah, Y. (2009), "Factors influencing the culture of a construction project organisation: an empirical investigation", *Engineering, Construction and Architectural Management*, Vol. 16 No. 1, pp. 26-47, doi: 10.1108/09699980910927877.

Baron, A. (2006), "Masculinity, the embodied male worker, and the historian's gaze", *International Labor and Working-Class History*, Vol. 69 No. 1, pp. 143-160, doi: 10.1017/s0147547906000081.

Bergman, B., Larsman, P. and Löve, J. (2014), "Psychometric evaluation of the 'men's polarized gender thinking questionnaire (MPGQ)'", *Gender in Management: An International Journal*, Vol. 29 No. 4, pp. 194-209, doi: 10.1108/gm-07-2013-0077.

Bishop, J., Bouchlaghem, D., Glass, J. and Matsumoto, I. (2008), "Identifying and implementing management best practice for communities of practice", *Architectural Engineering and Design Management*, Vol. 4 Nos 3-4, pp. 160-175, doi: 10.3763/aedm.2008.0080.

Bourdieu, P. (1977), *Outline of a Theory of Practice*, Cambridge University Press, Cambridge.

Boyatzis, R.E. (1998), *Transforming Qualitative Information: Thematic Analysis and Code Development*, Sage, Thousand Oaks, CA.

Braun, V. and Clarke, V. (2006), "Using thematic analysis in psychology", *Qualitative Research in Psychology*, Vol. 3 No. 2, pp. 77-101, doi: 10.1191/1478088706qp063oa.

Bresnen, M., Edelman, L., Newell, S., Scarbrough, H. and Swan, J. (2005), "Chapter 5 - a community perspective on managing knowledge in project environments", in Love, P.E.D., Fong, P.S.W. and Irani, Z. (Eds), *Management of Knowledge in Project Environments*, Butterworth-Heinemann, Oxford.

Bryman, A. (2004), *Social Research Methods*, Oxford University Press, New York.

Chan, P.W. (2011), "Queer(y)ing construction: exploring sexuality and masculinity in construction", *Proceedings 27th Annual ARCOM Conference, 2011*, Association of Researchers in Construction Management, Bristol, pp. 5-7.

Chanal, V. and Kimble, C. (2010), "Born to be wild: using communities of practice as a tool for knowledge management", *Ethicomp*, Tarragona.

Chappell, L. (2016), *The Politics of Gender Justice at the International Criminal Court: Legacies and Legitimacy*, Oxford University Press, New York.

Çınar, S. (2020), "Construction labour, subcontracting and masculinity: 'construction is a man's job'", *Construction Management and Economics*, Vol. 38 No. 3, pp. 275-290, doi: 10.1080/01446193.2019.1690155.

Cohen, L., Manion, L. and Morrison, K. (2011), *Research Methods in Education*, Routledge, Oxon.

Crouch, M. and Mckenzie, H. (2006), "The logic of small samples in interview-based qualitative research", *Social Science Information*, Vol. 45 No. 4, pp. 483-499, doi: 10.1177/0539018406069584.

Dainty, A.R., Bagilhole, B.M. and Neale, R.H. (2000), "A grounded theory of women's career under-achievement in large UK construction companies", *Construction Management and Economics*, Vol. 18 No. 2, pp. 239-250, doi: 10.1080/014461900370861.

Deery, S., Walsh, J. and Guest, D. (2011), "Workplace aggression: the effects of harassment on job burnout and turnover intentions", *Work, Employment and Society*, Vol. 25 No. 4, pp. 742-759, doi: 10.1177/0950017011419707.

Department of Employment and Workplace Relations (2025), *Building Women's Careers Program*, Department of Employment and Workplace Relations, available at: https://womeninconstruction.au/about-us (accessed 21 January 2026).

Elmualim, A.A. and Govender, K. (2008), "Communities of practice in UK large contracting firms: contrasting application and non-utilized merits", *Architectural Engineering and Design Management*, Vol. 4 Nos 3-4, pp. 149-159, doi: 10.3763/aedm.2008.0073.

Fontana, A. and Frey, J. (2005), "The interview: from neutral stance to political involvement", in Denzin, N. and Lincoln, Y. (Eds), *The SAGE Handbook of Qualitative Research*, 3rd ed., Sage Publications, Thousand Oaks.

Franzosi, R. (2004), "Content analysis", in Lewis-Beck, M.S., Bryman, A. and Liao, T.F. (Eds), *The Sage Encyclopedia of Social Science Research Methods*, Sage Publications, Thousand Oaks.

Fusch, P. and Ness, L. (2015), "Are we there yet? Data saturation in qualitative research", *The Qualitative Report*, Vol. 20 No. 9, pp. 1408-1416, doi: 10.46743/2160-3715/2015.2281.

Galea, N. (2018), *Built for Men: Institutional Privilege in the Australian Construction Industry*, UNSW, Sydney.

Galea, N. and Chappell, L. (2022), "Male-dominated workplaces and the power of masculine privilege: a comparison of the Australian political and construction sectors", *Gender, Work and Organization*, Vol. 29 No. 5, pp. 1692-1711, doi: 10.1111/gwao.12639.

Galea, N., Powell, A., Loosemore, M. and Chappell, L. (2015), "Designing robust and revisable policies for gender equality: lessons from the Australian construction industry", *Construction Management and Economics*, Vol. 33 Nos 5-6, pp. 375-389, doi: 10.1080/01446193.2015.1042887.

Galea, N., Powell, A., Loosemore, M. and Chappell, L. (2020), "The gendered dimensions of informal institutions in the Australian construction industry", *Gender, Work and Organization*, Vol. 27 No. 6, pp. 1214-1231, doi: 10.1111/gwao.12458.

Galea, N., Powell, A. and Salignac, F. (2023), "The role of homosociality in maintaining men's powerfulness in construction companies", *Construction Management and Economics*, Vol. 41 No. 2, pp. 172-182, doi: 10.1080/01446193.2022.2151025.

Galletta, A. and Cross, W.E. (2013), *Mastering the Semi-Structured Interview and Beyond: From Research Design to Analysis and Publication*, New York University Press, New York.

George, M. and Loosemore, M. (2019), "Site operatives' attitudes towards traditional masculinity ideology in the Australian construction industry", *Construction Management and Economics*, Vol. 37 No. 8, pp. 419-432, doi: 10.1080/01446193.2018.1535713.

Hizar Md Khuzaimah, K. and Hassan, F. (2012), "Uncovering tacit knowledge in construction industry: communities of practice approach", *Procedia - Social and Behavioral Sciences*, Vol. 50, pp. 343-349, doi: 10.1016/j.sbspro.2012.08.039.

Holdsworth, S., Turner, M., Scott-Young, C.M. and Sandri, K. (2020), *Women in Construction: Exploring the Barriers and Supportive Enablers of Wellbeing in the Workplace*, RMIT University, available at: https://www.rmit.edu.au/content/dam/rmit/documents/about/academic-schools/property-construction-project-management/report-women-in-construction-exploring-the-barriers-and-supportive-enablers-of-wellbeing-in-the-workplace.pdf (accessed 30 November 2023).

Holdsworth, S. and Turner, M. (2022), *Career Pathways of Women in Construction: Boots on the Ground*, RMIT University, available at: https://www.vic.gov.au/sites/default/files/2023-03/Career-Pathways-of-Women-in-Construction-Boots-on-the-Ground.PDF (accessed 26 Feburary 2026).

Holdsworth, S., Turner, M. and Sandri, O. (2023), "Gender bias in the Australian construction industry: women's experience in trades and semi-skilled roles", *Social Sciences*, Vol. 12 No. 11, 627, doi: 10.3390/socsci12110627.

Lave, J. and Wenger, E. (1991), *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press, Cambridge.

Liu, K., Su, Y., Pollack, J., Liang, H. and Zhang, S. (2022), "Explaining the formation mechanism of intrateam knowledge exchange network in offsite construction projects: a social cognitive perspective", *Journal of Construction Engineering and Management*, Vol. 148 No. 2, 04021192, doi: 10.1061/(asce)co.1943-7862.0002190.

Love, P.E.D. (2009), "Editorial: communities and champions of practice: catalysts for learning and knowing", *Construction Innovation*, Vol. 9 No. 4, pp. 365-371, doi: 10.1108/14714170910995912.

Nowell, L.S., Norris, J.M., White, D.E. and Moules, N.J. (2017), "Thematic analysis: striving to meet the trustworthiness criteria", *International Journal of Qualitative Methods*, Vol. 16, pp. 1-13.

Oswald, D., Wade, F., Sherratt, F. and Smith, S.D. (2019), "Communicating health and safety on a multinational construction project: challenges and strategies", *Journal of Construction Engineering and Management*, Vol. 145 No. 4, 04019017, doi: 10.1061/(asce)co.1943-7862.0001634.

Paechter, C. (2003a), "Learning masculinities and femininities: power/knowledge and legitimate peripheral participation", *Women's Studies International Forum*, Vol. 26 No. 6, pp. 541-552, doi: 10.1016/j.wsif.2003.09.008.

Paechter, C. (2003b), "Masculinities and femininities as communities of practice", *Women's Studies International Forum*, Vol. 26 No. 1, pp. 69-77, doi: 10.1016/s0277-5395(02)00356-4.

Remington, K. and Ragsdell, G. (2006), "Managing knowledge in construction projects: examining the contribution of communities of practice", in Runeson, G. and Best, R. (Eds), *31st Annual AUBEA Conference*, University of Technology Sydney.

Ruikar, K., Koskela, L. and Sexton, M. (2009), "Communities of practice in construction case study organisations: questions and insights", *Construction Innovation*, Vol. 9 No. 4, pp. 434-448, doi: 10.1108/14714170910995967.

Sandberg, R., Räisänen, C., Löwstedt, M. and Raiden, A. (2016), "Exploring the work practices of site managers as processes of embodiment", in Chan, P.W. and Neilson, C.J. (Eds), *32nd Annual ARCOM Conference*, UK Association of Researchers in Construction Management, Manchester, 5-7 September 2016, pp. 679-688.

Schenkel, A. and Teigland, R. (2008), "Improved organizational performance through communities of practice", *Journal of Knowledge Management*, Vol. 12 No. 1, pp. 106-118, doi: 10.1108/13673270810852421.

Snape, D. and Spencer, L. (2003), "The foundations of qualitative research", in Ritchie, J., Lewis, J. and Elam, G. (Eds), *Qualitative Research Practice. A Guide for Social Science Students and Researchers*, Sage, Thousand Oaks, CA.

State Government of Victoria (2022), *Building Equality Policy*, State Government of Victoria, available at: https://content.vic.gov.au/sites/default/files/2023-01/Final-Building-Equality-Policy.pdf (accessed 30 November 2023).

State Government of Victoria (2024), *Victoria's Women in Construction Strategy*, State Government of Victoria, available at: https://www.vic.gov.au/victorias-women-construction-strategy (accessed 21 January 2026).

Stergiou-Kita, M., Mansfield, E., Bezo, R., Colantonio, A., Garritano, E., Lafrance, M., Lewko, J., Mantis, S., Moody, J., Power, N., Theberge, N., Westwood, E. and Travers, K. (2015), "Danger zone: men, masculinity and occupational health and safety in high risk occupations", *Safety Science*, Vol. 80, pp. 213-220, doi: 10.1016/j.ssci.2015.07.029.

Styhre, A. and Gluch, P. (2010), "Managing knowledge in platforms: boundary objects and stocks and flows of knowledge", *Construction Management and Economics*, Vol. 28 No. 6, pp. 589-599, doi: 10.1080/01446190903450061.

Terry, G., Clarke, V., Hayfield, N. and Braun, V. (2017), "Thematic analysis", in Willig, C. and Stainton Rogers, W. (Eds), *The SAGE Handbook of Qualitative Research in Psychology*, SAGE Publications, London.

Wanberg, J., Javernick-Will, A., Chinowsky, P. and Taylor, J.E. (2015), "Spanning cultural and geographic barriers with knowledge pipelines in multinational communities of practice", *Journal of Construction Engineering and Management*, Vol. 141 No. 4, 04014091, doi: 10.1061/(asce)co.1943-7862.0000955.

Wanberg, J., Javernick-Will, A. and Taylor, J.E. (2017), "Mechanisms to initiate knowledge-sharing connections in communities of practice", *Journal of Construction Engineering and Management*, Vol. 143 No. 11, 04017085, doi: 10.1061/(asce)co.1943-7862.0001399.

Webster-Wright, A. (2009), "Reframing professional development through understanding authentic professional learning", *Review of Educational Research*, Vol. 79 No. 2, pp. 702-739, doi: 10.3102/0034654308330970.

Wenger, E. (1998), *Communities of Practice: Learning, Meaning and Identity*, Cambridge University Press, New York.

Workplace Gender Equality Agency (2024), *Australia's Gender Equality Scorecard*, Australian Government, available at: https://www.wgea.gov.au/sites/default/files/documents/Australia%27s%20Gender%20Equality%20Scorecard%202023-24_V10.pdf (accessed 21 January 2026).

Wright, T. and Conley, H. (2018), "Advancing gender equality in the construction sector through public procurement: making effective use of responsive regulation", *Economic and Industrial Democracy*, Vol. 41 No. 4, pp. 1-22, doi: 10.1177/0143831x17745979.

Yu, W.-D., Lin, T.-C., Liu, S.-J. and Chang, P.-L. (2013), "Is the knowledge management system truly cost effective? Case study of KM-enabled engineering problem solving", *Journal of Construction Engineering and Management*, Vol. 139 No. 2, pp. 216-224, doi: 10.1061/(asce)co.1943-7862.0000604.

Zhang, L., Yuan, J., Ning, Y., Xia, N. and Zhang, G. (2022), "Enhancing the impacts of absorptive capacity on interorganizational collaboration in BIM-enabled construction projects – an SLT perspective", *Engineering, Construction and Architectural Management*, Vol. 29 No. 10, pp. 4215-4240, doi: 10.1108/ecam-11-2020-0931.

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